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B. BURGESS, CAPTAIN,
Secretary.

WHITEHALL YARD,
July 1889.



The Journal OF THE Royal United Service Institution.

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Wednesday, May 1, 1889.

GENERAL THE RIGHT HON. VISCOUNT WOLSELEY, K.P., G.C.B.,
G.C.M.G., &c., &c., Adjutant-General to the Forces, in the Chair.

FORTIFICATION AND FLEETS.

By Major G. R. WALKER, R.E.

Major G. R. WALKER, R.E. : May I be allowed to preface my paper by a brief explanation? After I had undertaken to prepare a paper on this subject, and before I had time to complete it, Admiral Colomb read a paper in March,¹ which seemed to me to change the aspect of affairs very considerably. Admiral Colomb's paper left me in this dilemma, that if I did not take any notice of it, but read my paper according to my original plan, I could only have done so from two considerations: the first, that there was nothing in Admiral Colomb's paper to answer, which, of course, was absolutely precluded by the Admiral's ability and weight in all matters of this kind; and secondly, the conclusion that must have been come to if I had merely read an abstract paper upon fortification without noticing Admiral Colomb's arguments, would have been that there was no answer to them. I, therefore, felt bound to answer, as far as in me lay, Admiral Colomb's objections to fortification, as I imagine them to be. But in doing so I have been obliged to cut out a very large part of the original paper, and, I am afraid, to curtail it in a very unsatisfactory way, and especially I have been obliged to leave out all reference to some modern scientific improvements, in their bearing upon fortification, which I was very anxious to mention: two especially, position-finding, and the introduction of pneumatic guns—position-finding, more particularly, because, in a recent paper in this theatre, it was very incorrectly described, and I thought it would be well, perhaps, to say a few words about it.

ENGLAND is the only civilized country where, at the present time, it is possible to stand up and to deny, with any chance of acceptance, the utility of permanent fortification. The discredit which in this country alone attaches to this, one of the most useful subsidiaries of defence, is due to our insular position, and to the very widespread superstition which exists amongst Englishmen that the sea alone is a sufficient defence, and that they can, in consequence of their separation by the sea from the European Continent, look down in selfish complacency upon the struggles and sacrifices of the less favoured nations who are cursed with land frontiers.

¹ "On the Relations between Local Fortifications and a Moving Navy" (see Journal, No. 147, page 149, *et seq.*).

This unreasoning dependence upon the protection afforded by the accident of insularity may possibly be traced to our great national poet, whose sentiments colour largely, though often unconsciously, much of the popular thought even of our own day.

The well-known lines—

“ This fortress built by Nature for herself,
Against infection and the hand of war ;
* * * * *

This precious stone set in the silver sea,
Which serves it in the office of a wall,
Or as a moat defensive to a house,
Against the envy of less happier lands.”

echoed as they have been by many subsequent writers, are probably largely responsible for the fact that the average Englishman looks with suspicion, the unreasoning suspicion of ignorance and prejudice, upon those who feel it to be their duty to enlighten him as to the real nature of the dangers to which the country is exposed, and as to the folly of trusting exclusively to the maritime frontier for defence. But though this popular ignorance is no doubt widely spread, I hardly expected to find Admiral Colomb appealing to it in his letter to the “Times” (11th March, 1889), with the time-worn platitude “Britannia needs no bulwarks, no towers along the steep;” the alternative being of course the wooden walls.

In fact, says the gallant Admiral, Britannia rules the waves, and in his paper lately read in this Institution, he asserts that there is consequently no fear of any territorial attack, not only on the shores of these islands, but even on any part of the Empire, and in his character as advocate he goes so far I think as to attempt to show that we may dismantle our fortresses as being useless, though he shrinks apparently from the further deduction drawn by General Erskine from his paper, that we should also disband our land forces.

In his general reply to the discussion on his paper Admiral Colomb, as I understood him, withdrew so far from the position which he had assumed in order to invite discussion, as to admit the usefulness of fortification within certain limits, and only to object to its employment on a large scale. He did not, however, define the amount of fortification which he would admit, except in a rather vague and unwilling concession of “light batteries” for the commercial ports. But his concessions in this theatre seem to me completely revoked by his letter to the “Times” of the 11th March, in which he says, “the discoveries of science and the fluctuation of opinion have been fatal to fortification;” and in an able leader in the “Times,” on the morning after Admiral Colomb’s lecture (1st March),¹ we find all his arguments pushed to their logical conclusions, with the inevitable result plainly stated in these words, viz., “Every penny spent on fortifications before our Navy is made strong enough to take and keep command of the sea is a penny wrongly spent, to say the least, if not absolutely thrown away.”

Again, Professor Laughton, in the “Morning Post” (9th March),

¹ See Journal, No. 147, page 149 *et seq.*

enforcing Admiral Colomb's arguments, accuses those who took part in the discussion on Admiral Colomb's paper, especially the military Officers, of having misunderstood him so far as to believe he wished to leave our ports undefended, whereas, he says, Admiral Colomb only contended that they should be rightly defended, *i.e., by ships*. But that there might be no mistake as to the meaning of his paper, Admiral Colomb, in his letter to the "Times" already quoted, institutes a comparison between ships and forts, to show that the reverse of the commonly received opinion is true, that ships last from generation to generation, while forts have to be pulled down about every twenty years, to make room for their successors; this, broadly stated, is the gist of that letter.

Now putting aside all fine distinctions, the broad meaning of all this is, that until our Navy is strong enough to take and keep command of the sea, not a penny is to be spent (there is the kernel of the whole matter) on any subsidiary such as fortification; and that means, if words have any meaning, cease even to maintain your existing works, and above all do nothing to increase their efficiency, as to do so will cost money which might otherwise be spent on the Navy.

This is the broad issue, and in support of his contention Admiral Colomb brings forward many arguments, appealing chiefly to history. Now this appeal is perfectly just; the principles of strategy are universal and unchanging, but it must be accompanied by a fair consideration of the fact that even in the sphere of strategy the changed conditions lead to some alterations, not in the eternal principles, but in their application under given conditions.

On page 5 of his paper, Admiral Colomb says: "Steam and electricity have everywhere replaced uncertainty and chance by certainty, and have immensely shortened times and distances as measured by times;" but he has omitted a very important point, which has a large bearing on the question at issue, viz., that they have also greatly increased the frequency of the *necessary* communications with the base, both for the supply of coals and for refitting. This omission is, I think, a fair example of the half truths by which Admiral Colomb's arguments are sustained.

Admiral Colomb, in his paper, maintains the following propositions, *viz.* :—

1. That at the commencement of a war the superior naval Power takes command of the sea, and that she never loses this command at any time or in any place during the struggle. Wherever an enemy's squadrons appear they are at once confronted by a superior force of the superior naval Power, and instantly driven back to the cover of the land forts, which are admittedly useful to the inferior naval Power.
2. That no enterprise against an enemy's territory or fortresses is possible within 700 miles even of an inferior hostile fleet, and that such enterprises must always be abandoned if there is the least chance of the loss of command at sea.
3. That a fortified base confers practically no advantages upon a

fleet, either in the way of freeing the fleet for offensive operations at sea, or of facilitating its refitting.

4. That the possession of maritime fortresses follows the command of the sea.

5. That fortifications have never resisted a determined attack from the sea.

And in his letter to the "Times," quoted above, he adds a rider, *viz.* :—

6. That ships are long lived as compared with land works, and therefore more economical.

I shall now endeavour to meet these contentions in detail.

1. The assumption as to the command of the sea involves the attainment by the superior navy, *at the outbreak of war*, of a condition of comparative superiority to all other naval Powers which is perfectly Utopian. It is undeniable that if the British Navy be so strong that it can watch every possible enemy with a superior force, protect every port and every trade route over the whole surface of the globe, chase and bring to justice every "Alabama" that may break loose from any neutral port to prey upon commerce, and do all this with a force which shall provide ample reserves against every casualty caused by the manifold dangers to which the complicated modern war steamer is exposed, then Admiral Colomb's argument is unanswerable from the military point of view; everything has been done, therefore nothing remains to do. But the question would even then remain, is this the most economical method of doing the work? Certain duties of local defence of depôts, arsenals, &c., have (I assume for the present) to be performed, and to perform them efficiently in the absence of local defence, some portions of the superior fleet must be detached as permanent local guards for these ports. It is not necessary to argue that for such purposes the defence could be more economically carried out by coast defences; even Admiral Colomb's strong supporter, the "Times," says (30th August, 1887): "Ten or twelve guns can be mounted, *even in War Office cupolas*, for less than the cost of a single ironclad," and "these guns would render the Mersey or the Clyde secure at a fraction of the cost of defence by a fleet." Truly "a Daniel come to judgment."

I know it will be objected, but we have, *ex hypothesis*, command of the sea, and we need not therefore detach ships because every squadron of the enemy will be opposed by a superior British squadron, and therefore if he appear before a port for the purpose of attack, the superior British squadron will be there for defence, and until the enemy's squadron appears, the port may be left to itself, for there is no one to attack it. Now if this be true, it is true of Portsmouth or Plymouth or Malta, as well as of the ordinary commercial ports, and all such naval arsenals may be left undefended; indeed the gallant Admiral in his paper, in putting the imaginary case of the appearance of an enemy's squadron off Plymouth, expressly asserts that the fortifications are perfectly useless, and that even without them the place would be unassailable, because of the flanking fleet off Brest.

Now let us look at some facts: there is, I presume, no doubt that

England had the undisputed command of the sea after Trafalgar, and up to the end of the war: "In 1810 we had 664 cruisers at sea as against 105 in 1887, and though 19 of the enemy's cruisers were captured in less than a month, still in one fortnight, 20 British ships were captured by the enemy close to our coasts."¹ Where were our superior fleets; why was there not a superior force present on every occasion to save these British ships? Simply because it was an utter impossibility, even for the large number of ships we then had at sea, to be everywhere, even over the comparatively limited areas then to be watched and guarded, and how much more would that be the case to-day? Admit even the inadmissible, that the British squadrons are sufficient to watch all the enemies' fleets; that they are impervious to all attacks by any possible enemy; that for once in war the unforeseen shall never happen, that the weather shall be as complaisant as the enemy is weak; that there shall be no dangerous rocks, no hidden shoals, no earthquake, no hurricane, no worn-out boilers, no broken down machinery; admit, in fact, the impossible, and still what remains? Why that even by Admiral Colomb's own admission, the sea will be covered with the enemy's cruisers which cannot be restrained from taking the sea and doing mischief, and as a necessary consequence that every important base and every naval arsenal, if left undefended by fortification, will have to be watched and defended by ships told off for the purpose and chained to the port. Because I assert that Admiral Colomb's assumption that such cruisers would not attack undefended ports for fear of interruption, is altogether untenable.

He says, in the imaginary case of Plymouth quoted above, that the dread of interruption would prevent an enemy from sailing up the harbour and destroying the dockyard, even though there were no fortifications; but this makes surely too great a demand on our credulity; naval history may answer "No," but what would be said by his superiors to a naval Officer in command of a powerful modern cruiser, with all the means of destruction at his command, who should refuse to strike such a blow as the destruction of one of our great naval arsenals for fear of interruption? Steam gives certainty; quite so. It would give this Officer just a certain number of hours to blow in dock gates, burn the dockyard, and the certainty of being able to leave again, bar accidents, just in time. The matter is hardly susceptible of further argument; it is a practical question, which I rejoice to think has been put out of the power of an enemy's cruiser to decide against Admiral Colomb, by the common sense of our rulers, who have fortified Plymouth.

But let us look outside the British Isles and the narrow seas: the British Empire is scattered over the habitable globe, and if reasons have been given for refusing to believe that even the most powerful fleet can ever keep the coasts of the home islands entirely free from the enemy, how much more will it be impossible to protect every dépôt and dockyard throughout the world.

¹ Admiral Colomb, in "Manchester Courier," 3rd December, 1887.

We have been considering the question hitherto on the assumption that we have the command of the sea, to the fullest possible extent to which it can be assured, by raising our fleet to the position of superiority demanded by naval Officers, but let us descend into the region of practical politics, and ask what this fleet is, to which alone we are requested to entrust the safety of the naval arsenals and depôts. Why by the confession of the Admiralty itself, a sum of about $12\frac{1}{2}$ millions must be spent, in addition to the usual estimates, within the next four years, not in order to create an ideal navy, but simply to bring the Navy up to a condition to enable us to fulfil the *minimum* requirements in a war with any two naval Powers. In other words, the Navy is at the present moment short of a large number of ships to the value of $12\frac{1}{2}$ millions of money, and this is the result of the administration in years of profound peace, during which we have been told over and over again by official authority, that all things were well with the Navy. Is this an encouraging time to ask us to put all our eggs into one basket, the Navy?

Again, are these $12\frac{1}{2}$ millions sufficient? Supposing we get through the programme, and at the end of four years have 70 ships added to the Navy, shall we then be able to take and keep command of the sea, in the sense meant by Admiral Colomb? I will quote some naval opinions.

Admiral Sir G. Hornby¹ states our requirements in cruizers alone at 186, of which we had only 22 which he considered efficient; and the same gallant Officer,² in reply to Mr. Forwood, who had said that his demand for 186 cruizers was absurd, states that in 1794 we had 180 cruizers at sea, in 1803 during the Peace of Amiens, 146 in commission and 178 in reserve, in 1804, 257 at sea, in 1812, 444 at sea. He wanted, he said, only 57 new cruizers to make up the required number; he then adds some caustic remarks on the system of administration which, with 106 cruizers in commission, and 23 ready for sea, had actually only 37 effectives out of the whole lot.

In another letter to the public press³ the same gallant Officer gives the number of ironclads required to blockade the 14 French ships at Toulon as 16, which would require 24 ironclads in the Mediterranean (we had, I think, 7 or 8 in that sea at the time), while we had only 28 all told. He considered that 12 additional ironclads should be built.⁴

Sir John Hay, speaking of battle-ships alone, said, if I recollect rightly, in a discussion in this theatre, that we wanted 28 additional battle-ships, and he put their cost at 27 millions. But there are only 8 battle-ships in the new Government programme.

¹ In the City, 5th June, 1888. ² "St. James's Gazette," 11th July, 1888.

³ "Daily Telegraph," 25th July, 1888.

⁴ But in the "Fortnightly" for November, Admiral Hornby, after the experience of the naval manœuvres, puts the requirements much higher. He says there that to blockade the 16 ships at Toulon would require 22 British ships, which would necessitate raising the Mediterranean fleet to 33 battle-ships; and he consequently puts our total requirements at 30 additional battle-ships and something like 250 cruizers.

Finally, in the report on the naval manœuvres published in the "Times," 21st February, 1889, it is officially stated that "Great Britain is *very far* from being as strong as she should be on the seas." And the Committee proceed to give details of the work required to be done, which considerably emphasize the "*very*."

I do not pretend to decide between the conflicting estimates given above, but one thing is absolutely clear, *viz.*, that there is a consensus of naval opinion as to the insufficiency of the Fleet, and a very strong body of opinion that the proposed increase is inadequate to bring the Fleet up to the minimum requirements of safety; and yet it is at this crisis that we are invited to agree to the proposition that the defence of our naval arsenals and depôts by fortification is an exploded error, and that their protection should be left altogether to our all-powerful Fleet.

There is also a claim made, the fallacy of which should be noticed; that as the Fleet is increased, so the amount of money spent on fortification should be diminished; but since it is admitted that until the Fleet is perfect, and indeed after it is perfect, there will always be a possibility of some of the enemy's ships breaking loose, and escaping the blockading squadron of the superior Power, it follows that these ships, which may be of most powerful types, and may be found in any sea, can only be prevented from making disastrous raids on dock-yards or commercial ports by the maintenance of *efficient* fortifications kept up to date defensively and armed with effective guns.

2. "No enterprise against an enemy's territory or fortresses is possible within 700 miles even of an inferior hostile fleet, and such an enterprise must always be abandoned if there is the least chance of the loss of command at sea."

Let us look at the facts. The crucial test of the truth of this proposition is stated by Admiral Colomb to be the conduct of the French Baltic Fleet during the Franco-German War, which, though it had undoubtedly the command of the sea, refused to risk the simple bombardment of the coast town of Colberg because there was an inferior Prussian squadron (three ironclad frigates) 700 miles away in the Jade. Admiral Bouët-Willaumez arrived at Kioge Bay on the 9th August with seven ironclad frigates; he had absolute command of the Baltic, and could have been under no apprehension of interruption by the Prussian ships from Wilhelmshaven, as they were blockaded *there* on the 11th August by a second superior French fleet. Bouët sailed from Kioge Bay to Dantzig, where he arrived on the 21st August, and then returned to Kioge Bay; he passed Colberg both going and returning; why did he not bombard? I have shown that the supposed flanking fleet was itself blockaded, and therefore was quite out of the reckoning. We must look for another cause, and it is not far to seek. The Germans were already in possession of a material guarantee in France, and, I believe, threatened reprisals if their coast towns were injured, and this combined with the loss of *morale* on the French side, and the evident hopelessness of making any real diversion in favour of France, are quite sufficient to account for Count Bouët's inaction. His fleet was also, it is believed, badly found, in fact, he

had every inducement to do nothing. But mark the sequel. On the 13th September, in obedience, I believe, to orders from home, Count Bouët did actually order his fleet from Kioge Bay to bombard Colberg. Now, at this date, the blockade of the Jade had been raised; the French North Sea Fleet had returned to France (on 11th September), and Bouët knew it; the Prussian ironclads were free, and still the French fleet left Kioge Bay to bombard Colberg. They were overtaken by a storm, and returned without effecting anything; but if the Admiral had feared the Prussian flanking fleet, would he have given the order, after Sedan, when all hope of success was practically gone, would he have run this risk, if it were a risk?

I will take another example which I think is to the point. In 1854 the combined English and French Baltic fleets amounted to 18 ships of the line and 9 steamers. The Russian fleet which retired before them into Cronstadt numbered 22 ships of the line, 5 frigates, and other vessels. After reconnoitring Cronstadt, and finding it too strong to attack with the means at their disposal, the Admirals proceeded to the Aland Isles, and leaving the Russian fleet, which was actually superior in numbers, close on their flank, they, in concert with a French expeditionary force, landed guns and men, and after constructing siege batteries, attacked and took the strong Russian casemated works of Bomarsund. A small force of about nine ships was left to observe the Russians in the Gulf of Finland; but, as I have said, the lighter vessels of the fleet were entangled in the intricate channels between the islands, and guns and men actually disembarked for the attack of a land fortress, in close proximity to a flanking fleet, which not only might, but which it was expected would, sally out from Cronstadt. Can anything be more clear than that the theory put forward of the extraordinary power of the flanking fleet does not hold good universally?

Take now the case of Gibraltar, as stated in Admiral Colomb's paper: the Spaniards "having command of the sea," in 1780, "made a most determined set at Gibraltar," and the place was only saved by its being relieved in 1780, '81, and '82, by the British fleet; or, in other words, the Spaniards attempted an attack upon a strong maritime fortress, though they were in danger of losing, and did actually (on the occasions named) lose the command of the sea, and were driven off by the British fleet; but they returned again and again to the attack, and the place must have fallen into their hands during the absence of the British fleet but for its fortifications.

Professor Laughton, in the discussion on Admiral Colomb's paper, endeavoured to show the inutility of fortification by asserting that the fortifications of Gibraltar, which enabled it to hold out, and thus necessitated its relief, cost us our American Colonies, by withdrawing the fleet from America at a critical time; but this argument amounts to less than nothing as against the utility of fortification. The British Government may have been ill-advised in wishing to retain Gibraltar, but they did wish it, and the fortification of the Rock enabled them to hold it, which they could not otherwise have done; the fortifications, therefore, completely fulfilled the purpose for which

they were intended, which purpose without them would inevitably have failed.

Then there is the French invasion of Egypt in the face of the hourly fear of interruption by a fleet, which events proved was quite able to hold command of the sea. Nelson left Sicily after the French, and passing them on the way, arrived first at Alexandria, and not finding the French there he sailed north looking for them; the next day the French arrived at Alexandria, and the invasion of Egypt was successfully accomplished. This is a very remarkable case: here is the greatest and most energetic of Admirals sailing all round a large hostile fleet without finding it, though the fleets were at one period barely out of sight of each other, and thus failing to prevent the landing of a great expeditionary force, which was risked by Napoleon on this slender chance. It is true the French fleet was afterwards destroyed, but only because they waited for Nelson's return at Alexandria; had they sailed away they might apparently have avoided him as easily in returning to Toulon as they did on the outward journey. And speaking of this very event, Sir G. Hornby asks very pointedly with reference to Nelson's failure to intercept the French fleet, "Are we sure to outdo him?"

But observe what the result of this theory would be, were it established: it would simply reduce the most powerful fleets to complete inaction, even though they might hold absolute command of the sea, and would apparently put an end to naval war. If Count Bouët's action in the Baltic in 1870-71 was paralyzed by the inferior Prussian fleet at Wilhelmshaven, what was the use to him of his command of the Baltic Sea? He could not even bombard Colberg for fear of expending his ammunition, he could therefore have undertaken no other operation which would result in the expenditure of ammunition, and his fleet, though holding command of the sea, was for all purposes of war practically non-existent. The mere statement of this dilemma shows the untenability of the proposition.

3. "A fortified base confers no advantages upon a fleet."

"It does not give freedom of offensive action." In his lecture, and subsequently, Admiral Colomb asserts very strongly that on this point no attempt even has been made to answer him. His argument I understand to be as follows, *viz.*: a fortified port as base does not give freedom to the defender's fleet, because the port not only requires to be locally protected, but also to have its communications kept open, and as the land defences cannot admittedly do this, they are utterly useless, and the fleet is just as much bound to the port as if there were no land defences.

There is here, I submit, a certain confusion of ideas. Admiral Colomb is assuming the possession of a superior fleet, and therefore it will be impossible for the enemy to keep ships continually lying off any of our ports, for the purpose of closing the port and capturing the commerce frequenting it, and therefore unnecessary for the superior fleet to keep vessels continually on guard for defensive purposes. What we admittedly have to fear is the breaking away of one or more of the enemy's powerful cruisers, who, if there be any

important port left undefended, will certainly make a raid upon it, or else a temporary loss of command of the adjoining sea, by some naval disaster. In either case the port attacked will necessarily be closed while the enemy is in the vicinity, and probably considerable damage will be done to commerce, such as was done continually along our coasts in the Napoleonic war. The ports themselves, however, will, if fortified, remain uninjured, and ready as soon as the enemy is again beaten off to resume their *rôles* as naval or commercial harbours; whereas, on the other hand, if unfortified, any superiority established by the enemy, no matter how small or how short-lived, would result, in the case of the naval port, in the destruction of the docks and other permanent adjuncts to the efficiency of the fleet, and in the case of a commercial port, to the infliction of a heavy fine, as well as to possibledisastrous destruction of property, and of the facilities for future resumption of commerce. The inevitable results would be, I submit, that our fleet would, if the chief naval bases and commercial ports of this country were undefended by fortification, be greatly hampered in their offensive operations, by the fear of the destruction of these important interests during even a temporary absence.

Take again the imaginary instance of the blockade of Brest. Suppose an enemy's fleet shut up in Brest succeed in forcing the blockade with even one or two powerful swift cruisers, an assumption that I may fairly make, as after Berehaven Admiral Colomb admits, that "judgment must be suspended on the point whether *any* force would be competent to seal up a determined and enterprising enemy." What then would happen? Why the blockading fleet must inevitably return with all speed to protect its threatened home ports, thus releasing the bulk of the enemy's concentrated fleet for any mischief they can compass; while if those ports are secured by efficient local defences, they may be left in safety to their own resources, and the escaped cruisers to the tender mercies of the cruisers of the superior naval Power. I presume, therefore, that in this latter case the blockade might go on without interruption, the Admiral being freed from anxiety by means of the fortification of his base.

This view seems to be amply proved by the result of the naval manœuvres; the escape of a few ships from Berehaven obliged the British Admiral to abandon the blockade and to return in all haste to endeavour to protect the commercial ports.

But, again, leaving the home islands and the narrow seas, let us take the case of the Mediterranean, and imagine a blockade of Toulon, with an unfortified Malta. What would happen? We must, as is admitted, presume the possibility of the escape, at all events, of a part of the blockaded fleet. Anxiety for the fate of his base at Malta, left to the mercy of an unknown force of escaped vessels, will undoubtedly induce our Admiral to raise the blockade, giving liberty to the whole Toulon fleet to proceed on any enterprise it may desire to accomplish, with no certainty whatever that our fleet would catch them again in time; chained as it would undoubtedly be to Malta, until it was absolutely certain the enemy had gone elsewhere. But with Malta secure against all but an attack in great force, how different would be

the feelings of the blockading Admiral off Toulon; he could look with confidence on the security of his base and hold fast to his enemy.

Then there is the important question of refitting: Admiral Colomb has stated that an Admiral in command of a fleet is just as well off with an open roadstead as a base, and has given as an instance Nelson's operations in the Mediterranean, when Malta was in the hands of the French, to prove this contention. On this point we had a very valuable criticism by Sir Lintorn Simmons, who pointed out that during his period of command at Malta he had particularly noticed the frequency of the repairs which were necessary for the modern war vessel, even when engaged only in the ordinary duties of cruising in time of peace. This is, in fact, one of those points where a failure to bring prominently to notice the altered conditions of modern naval war vitiates the entire argument; it is quite possible that Nelson may have got on very well with his wooden fleet in open roadsteads, but how about the modern ironclad? Can it be contended for one moment that her necessities are as easily satisfied as the wooden line-of-battle-ship? In the item of coals alone her wants are incessant and enormous, and she must have a secure dépôt of supply. She is practically a moving fort, full of the most delicate and intricate machinery, which needs constant attention, and may at any moment need repair which requires the service of skilled artizans and well-found workshops to carry out; her very fabric, though so strong, is infinitely more subject to dangerous injury from modern modes of attack than was the fabric of the wooden liner from the offensive weapons of her day, not to speak of the everyday dangers of tempestuous seas and unsuspected rocks. All these things are against the iron-built ironclad steamers of to-day, and to assert that any open roadstead, selected from its convenience to the locality of the intended operations, will be as useful to a fleet of such vessels as a fortified and secure dockyard, seems hardly to require refutation by argument.

4. "The possession of maritime fortresses follows the command of the sea, illustrated by the cases of Malta, Gibraltar, and Minorca."

It must be observed in the first place that all the cases cited are very peculiar; two of them are small islands, only attackable from the sea, and Gibraltar, being practically impregnable on the short land front, is similarly open to attack only from the sea; and, in the second place, the facts even as regards these do not seem to be as alleged. The Spaniards had the command of the sea, 1780, '81, '82 (I quote Admiral Colomb), but they did not take Gibraltar. Why? Because it was strongly fortified. The French lost command of the Mediterranean in 1798, but we did not take Malta, it only fell two years after, by famine. Why? Because it was strongly fortified. Minorca did change hands rapidly with the alternating command of the sea. Why? Because it was not strongly fortified. But did any maritime fortress not thus peculiarly situated change hands with the command of the sea? Certainly not. We had absolute and undisputed command of the sea from Trafalgar to the end of the war; did the French maritime fortresses fall into our hands? This assertion may therefore be watered down to this very simple and well-known fact, that a fortress

which cannot be relieved must eventually succumb; but to say that this proves that one should never possess a fortress, is hardly a logical conclusion.

5. Again, "Fortresses have never successfully resisted an attack from the sea;" the obvious answer to this is, that we did not even venture to attack Cronstadt; and we failed miserably in the naval attack on Sebastopol; but I understand that Admiral Colomb has explained this away by saying that he meant by "attack from the sea," an attack by troops landed from ships, as, for instance, at Sebastopol; but here, as the attack was purely a land attack, and had no other relation to the navy than that its supplies came by sea, I hardly see what argument can be grounded upon it. We all know and admit that a fortress *adequately* attacked must eventually fall, simply because the superior force, which is capable of reinforcement in men and means, must weary out and destroy the *morale* of an inferior force, which, by the hypothesis, is not relieved. This has, however, no bearing on the point now at issue.

6. But the most hazardous statement made by Admiral Colomb is that contained in his letter to the "Times" of 11th March, in which he endeavoured to prove the superior durability of ships to forts, with a view to showing the absurdity of spending money upon the latter; and as this letter appeals especially to those who are likely to be equally uninformed as to the technical details of forts and ships, it seems to me to be peculiarly disingenuous.

What is the argument? "The ships built, beside the Martello towers" (before Waterloo), "lent themselves to the discoveries of science; were turned into steamers and served in the Russian War." Were they really the ships of 1815? While "the Martello towers are all but gone." What, not gone yet! thirty years after the ships have disappeared? I will, however, grant that in their present condition these towers are obsolete, but where are the ships of '54, not to mention those of 1815?

Again, "The steam line-of-battle ships built of wood at a later date lent themselves to the discoveries of science and the fluctuation of public opinion, and took their place as ironclads, the most powerful in the world. Lastly, the iron battle-ships built side by side with the forts of 1859-60, &c., and now things of the past (*sic*)," are, "the First Lord tells us, in process of being re-engined and re-gunned, so as, after lending themselves to the discoveries of science and the fluctuation of public opinion, to start on another twenty-five years' career of usefulness," while "we are distinctly told that the fortifications of 1859-60 are a thing of the past," and "If we are again to have a fortification outcry, and it succeeds, most of the present works must come down before the new ones can be put up." And this Admiral Colomb calls "*going unto history!*"

What are the facts? I will take the earliest type of fort of the period named, the masonry casemate with iron shield, and point out¹ that this undeniably obsolete work can, for a cost per gun of about

¹ Drawings were exhibited to illustrate this point.

¹⁰⁰th of the cost of a modern ironclad, be re-gunned and made practically impregnable,¹ not against its contemporary re-engined battleship, but against the most powerful ironclad of to-day; while the contemporary ship, though re-engined and re-gunned, and given a new lease of life, will not be an efficient battle-ship but only a cruiser, a ship of the second class—and this is the *worst* fort and the *best* ship.

Take the continuous iron-fronted forts, as at Spithead; they are as efficient to-day as the day they were built, bar the insufficient thickness of the iron skin; but this was foreseen and provided for, and it only wants the allotment of a sum, moderate indeed as compared with the cost of even one ironclad, to bring the defensive strength of these works up to date, while offensively they are up to date, carrying as they do heavy B.L. guns, a marvellous instance of adaptability in works that were designed for the 9-inch M.L. gun; and they may, in the future, be strengthened up to any required thickness of plating, which is manifestly not the case with a ship. Our re-engined ships will not have their strength increased one bit, only their speed and gun power, and another twenty-five years will finish them, while in another twenty-five years the forts will be in their early youth.

Take next the earthen barbette battery, or that with earth embrasures;¹ these need absolutely nothing but a thickening of the earth parapet, which is neither difficult nor expensive, and the necessary alterations to the emplacements to take the new guns when such are provided; and even in the re-gunned ships I presume that there will be some necessary alteration connected with the improved armament. These earthen batteries are, too, practically indestructible by time.

Here I cannot help noticing Admiral Colomb's poetic quotation, "Britannia needs no bulwarks: no towers along the steep;" it is absolutely true, and yet it is as misleading as the remainder of the letter. The word bulwark, in the fortification sense, applies to works much used about the fifteenth century, but long since vanished into the same limbo as the "Great Harry." The towers along the steep are, however, more modern, though hardly less obsolete, and Britannia does not want them either; she does, however, want, and I rejoice to think will have, certain sunken batteries along the steep; it is the most favourable situation for such batteries, as the Allied fleets found when the Telegraph Battery along the steep at Sebastopol, mounting five guns, disabled six line-of-battle ships and was itself untouched, a fact which, I think, to have been quite candid, the Admiral should have added to his letter.

I have hitherto dealt almost exclusively with the war navy, but it must not be forgotten that the fleet exists for the Empire, not the Empire for the fleet, and that a large part of the duties of the fleet in war will be connected with the protection of the commercial marine. It seems, therefore, not unreasonable to inquire how the defence of certain ports, or harbours of refuge, may affect the safety of the trading vessels, whose safe arrival in our ports is admittedly a condition of our national existence.

¹ Drawings were exhibited to illustrate this point.

It seems to be admitted that it will be impracticable to convoy our trade across the great ocean routes; there, in the open sea, our ships must trust to their speed and the sagacity of their commanders to avoid the enemy's cruisers; but as these routes converge into narrow seas the conditions will be different, and here it will no doubt be most advantageous, as has recently been pointed out by a distinguished naval Officer, to have ports secured by coast defences, into which such ships can run if pursued, where they can assemble in security, waiting convoy, if that be possible, through the narrow seas, or waiting for information that the coast is clear for them to make a dash for their destination, or at all events for the nearest fortified port, there to await in safety the next opportunity to move on; such harbours would not have their usefulness limited to the home islands. The foreign coaling stations, to which steamers must converge by the necessities of the case, would likewise, if fortified, afford them a safe refuge while coaling, or refitting, if necessary, and would enable them to await in safety a favourable opportunity for pursuing their voyages; and can it for one moment be denied that the existence of such safe refuges for trading vessels, where they might be safely left to the protection of the port defences, would be of inestimable value to the naval commanders engaged in the attempt to clear the neighbouring seas of the enemy's cruisers, leaving them free from all anxiety for those vessels which had run into the defended ports of refuge, and giving them in consequence vastly increased freedom of action in dealing with the enemy?

If, then, Admiral Colomb's conclusions are wrong, wherein lies the fallacy in his argument? It is, I think, twofold. In the first place, the command of the sea claimed for the superior Power is an absolute command at all times and in every place, no possibility of weakness or failure is admitted, and that this should be a necessary condition to the successful enforcement of his theory, displays at once its fatal weakness. Perfection is unattainable: the best human arrangements must always be liable to failure from a thousand unforeseen accidents, and that this is peculiarly the case in war has long been an axiom. He has also omitted to notice the practical difficulty; the fleet required to carry out his scheme of defence is manifestly entirely impossible of attainment. I have already shown that the additions now proposed for the Navy are by no means sufficient to satisfy naval opinion, and yet as regards even this small instalment an ex-Prime Minister has said in Parliament that he knows no reason for it. What chance is there then of getting the whole naval demand satisfied? But I do not rely on this argument, though it is practically available. I cannot agree that fortification only exists on sufferance because the fleet is weak; if all the money required for the defence of the Empire were voted to-morrow, it would still be folly to spend it all in ships, for two reasons: 1st, because a great deal of the work of coast defence can be much more cheaply done by local land defences than by ships; 2nd, because there is no panacea for all the ills that Empires or men are heirs to. A satisfactory defence of the Empire can only be attained by a just combination of all the elements of defensive

strength, ships, forts, material obstacles, organization of men. To exalt the value of the Fleet, which is admittedly the most important factor, above all the other component parts of the defence, to trust altogether to the first line without supports or reserves, and, above all, to commit the unpardonable sin in war, of undervaluing your enemy to such an extent as to think any possible precaution against his attacks may be safely omitted from your programme of defence, is to fly deliberately in the face of every lesson of history, and to carry the arts of the quack medicine man into the sphere of national defence.

In the second place it is assumed, equally fallaciously I think, that defeat must also be complete and absolute. This is the basis of the demand for the disbanding of the volunteers as useless on the ground that invasion of this country is unnecessary, because defeat at sea means rapid starvation, and compulsory surrender to any terms demanded by the victorious enemy. I confess that though I do not consider the British fleet to be endowed with a divine invincibility, I have a much higher opinion of its resources than to believe that the dispersion, or even destruction of one squadron, say in the Channel, must necessarily entail the collapse of the whole fleet and the surrender of the Empire, but I do say most unhesitatingly, that such destruction or dispersion may give just the opportunity for invasion, which I strongly believe to be possible, owing to the increased power of transporting troops at the right moment, without waiting for winds or tides, which steam has created. Consider what the prize is, and if a possible invader knew that once across the narrow sea he had nothing more to fear, how enormous the temptation; therefore, I say, with all due respect to Captain Penrose Fitzgerald, organize every defensive measure in its due proportion and in its proper place, and even serve out ball cartridge to the volunteers. "The first shot they fire in anger will," said that gallant Officer, "be the death knell of the British Empire;" suppose we grant even that, for the sake of argument, what will be more likely to defer the firing of that fatal shot than the knowledge that the volunteers are prepared to fire it, what more certain to accelerate the crisis than a suspicion that they have only blank cartridge in their pouches?

What, then, is the *rôle* of fortification? It is only delay says the gallant Admiral, and this, in a general sense, we may accept; the smallest field obstacle causes delay to the enemy under fire, and so increases his losses, and diminishes his moral force and his chance of ultimate success, the strongest permanent defensive works delay the enemy's attack, say upon a Portsmouth or a Malta, to the extent most probably of deferring it altogether; in either case the effect sought for is produced, and the fortifications have fulfilled the object for which they were created. Between these two extremes there is every variety of development, but the same principle is everywhere involved. The fortifications of the distant coaling station delay its occupation by the enemy's fast cruiser, till she is either compelled herself to retreat for want of coal, or is driven off by a relieving force. But it is said, why spend enormous sums on gigantic works

for this purpose? On this point I can only reiterate what I have already said in this theatre, that there is no enormous expenditure taking place, there are no gigantic works being erected, the defences which are at the present time being constituted throughout the Empire represent an absolute minimum, and strange to say, though all the schemes of defence are the result of joint consideration by military and naval Officers, it will, I believe, be found that the naval opinion in cases of difference was generally in favour of more extensive defences than those undertaken, which were watered down to suit the extravagant soldiers.

Having now, I think, given some reason for distrusting Admiral Colomb's conclusions as to the inutility of fortification generally, and the impossibility of attack by an expeditionary force upon the British Isles, I will venture to assume the advisability of defence other than naval, and to point out some considerations which bear upon the subject, and first, as to our maritime frontier in relation especially to the defence of the home islands; it has been pointed out that a maritime frontier is in its nature very much akin to a mountain frontier pierced by well-defined passes, and impassable at other points: the mountain passes being represented by the harbours, estuaries, or beaches along the coast suitable for the disembarkation of troops; but though apparently similar, there are important differences between the two cases, two of which should be noted, *viz.*:-

1st. The greatly increased facilities for surprise at the point selected for crossing the frontier, which results from the conveyance of the troops by sea in a compact body, instead of by difficult and narrow mountain roads, and this advantage is often combined with that of being able to put troops on shore simultaneously on a broad front.

2nd. There is the operation of landing from the transports, which introduces a period of great difficulty and danger into the assailant's enterprise, no matter how successfully it has been conducted up to that point, if this landing has to be made on an open beach; a difficulty depending on natural causes (wind and weather), altogether apart from any hostile opposition from the shore, though it is intensely aggravated by such opposition, while interruption from the sea may convert the difficulty into an impossibility fraught with disaster. Hence the value of secure harbours sheltered from the weather, and offering facilities for disembarkation, to an attacking force.

These considerations seem to me to point to the following conclusions regarding the defence generally, *viz.*:-

1st. The necessity for denying to the enemy, by means of local coast defences, the use of all harbours or estuaries specially suitable for disembarkation, and conveniently situated with reference to his objective point.

2nd. The great importance of a very careful organization of the defending force, and for a thorough system of watching the exposed

points, which, as in the case of much of the southern and eastern coasts of England, may be of considerable extent. I must not be mistaken as advocating an impossible defence by a cordon of troops or works, but only such an organization for the conveyance of intelligence, as combined with a careful selection of points for occupation by concentrated bodies of troops, and the intelligent use of railway communication, may insure that any attempt to land a considerable force shall be met with a more or less powerful resistance on the beach. A force attempting to land is never so helpless as during the period of transit from the ships to the shore, and to abandon all resistance at that point, in order to withdraw to positions, no matter how strong or how well chosen in the interior, is, I think, bad tactics. This was Nelson's opinion, and I think he was right, though the difficulty of carrying out such a defence efficiently, has, I think, tended to increase since his day. Steam alone has largely contributed to this difficulty, and added enormously to the chance of a successful surprise on an open coast, by rendering the assailant independent of wind and tide for his movements, and also by facilitating the actual landing, by the use of steam launches, &c., advantages which, I think, more than counterbalance the advantages of rapid concentration conferred by steam upon the defence.

The greatly increased value of the trained and disciplined soldier, as compared with raw levies, however brave, a value which every improvement in weapons tends to emphasize more strongly, tends also I think in the same direction.

Against coast batteries, however, the case is different, and I incline to the opinion that the chances of successful attack from the sea against such works, if properly designed and constructed, have been lessened rather than increased by modern improvements in arms and appliances of war.

Coast batteries must, however, be restricted to those vital points upon which the organization of our fleets and the security of our commerce depend, and must, as to their nature and extent, be directly proportioned in every case to the magnitude of the interests involved, or rather to the kind of attack which the nature of those interests renders probable.

It may be assumed that for us the great military ports (including Malta) are the only ones which require to be defended on the largest scale; the destruction of the naval establishments at Portsmouth would be so severe a blow to the prestige of the Empire and to the efficiency of the fleet, as to make it worth while to attack it in force if weakly defended, though the danger of attack is greatly reduced if not altogether eliminated by the existence of strong defences kept in an efficient condition.

With the commercial ports the case is different: the object to be gained by their capture would not compensate for the risk of valuable ironclads, and in this case, as well as in that of the great majority of the foreign coaling stations, the attacks to which they are exposed will probably be confined to raids by one or more swift cruisers, and the defences should therefore be designed on a much smaller scale, and

will, if efficient, have very probably the desired effect without firing a shot.

Now, as to the nature of the defences required, they must in the first place be permanent works designed and built in time of peace, for the very simple reason that the mountings of heavy B.L. guns, dealing as they do with excessively violent strains, require for their stability to be so massively and securely fixed, that there is no possibility of extemporizing emplacements for them; and here I must notice the consistent detraction of permanent fortification in articles in the public press, and even in speeches and papers in this theatre. Take, for instance, Captain Stone's opinion "that any elaboration of our complicated systems of permanent fortification is to lose sight of the end in the means," &c., &c., and "a couple of well-placed earthen barbette batteries might do more for the defence than the most approved casemate battery," &c., &c.; but does Captain Stone really think that the earthen barbette battery which he commends is not permanent fortification? And how constantly we hear the cry: "Oh, give us earthworks like Plevna, or like Sebastopol, but for Heaven's sake no permanent fortification." It really seems as if to many persons permanent fortification was synonymous with Vauban's bastioned traces or the so-called modern French system; whereas permanent fortification means simply works of defence, whether simple or complicated, built of permanent materials, as all works built before they are intended to be used must be, and as all works mounting modern heavy guns must necessarily be. How absurd this cry is may be gathered from the fact that the works now being constructed for the emplacements of the new guns which are being added to our sea fronts, though necessarily permanent, would in every case come under Captain Stone's definition of earthen barbettes, except where there is absolutely no earth available.

The types of works in existence in our maritime defences may be placed roughly in three classes:—

- I. The casemated masonry fort with iron shields.
- II. The casemated battery with continuous iron front.
- III. Earthen barbette or disappearing batteries, for guns mounted either on disappearing or overbank carriages.

Of these brief mention has been already made; and I have shown that while the first is practically obsolete in design, in the sense that it will not be reproduced, it may still be rendered capable of a good resistance to modern guns. While the second, given the additional thickness of plating rendered necessary by the increased power of guns, is as efficient now as when it was originally designed for the 9-inch M.L. gun, and might now be reproduced either in Grüsson iron, or wrought iron as in our forts, as one of the possible methods of defending certain limited and exposed sites.

But there is undoubtedly a strong feeling in favour of the third class, and it is a fact that every emplacement now being built throughout the Empire is of this class; wherever the sites are low and B.L. guns are provided, it is combined with a disappearing

mounting, and by this means I believe the maximum of defensive and offensive power for shore guns, against ships, is attained. Experiment¹ has actually proved that the chance of hitting a gun so mounted from a moving ship is extremely small.

The system of coast defence now in favour in this country is to take full advantage of the power of modern artillery, in order to disperse the guns both in plan and elevation without losing the power of mutual support, and also to give them the greatest possible amount of concealment by the use of disappearing mountings, and by the assimilation in appearance of the batteries to the surrounding ground.

The adoption of high-angle fire from heavy howitzers is another feature of the present system which promises good results and fortunately at small cost. There are numerous M.L. guns which, with slight alterations, make efficient howitzers; and since these weapons need not be placed even within sight of the water they command, their emplacements can be very cheaply constructed. It has been proved by experiment that the fire of such batteries, directed by position-finders, will be very formidable to ships whose decks cannot be made strong enough to resist the impact of heavy shells descending upon them at high angles.

The following results have been obtained experimentally, viz., 44 per cent. of hits on the deck of a stationary ironclad at ranges of from 3,000 to 4,000 yards with angles of elevation of 30° to 70°, and 20 per cent. of hits on the deck of the "Inflexible," with position-finder, at unknown ranges of 4,200 to 9,900 yards.

The general tendency then of modern progress in coast defence has been towards the dispersion and concealment of guns, and a reliance on the effect of flat earth slopes to deflect the enemy's heavy projectiles, rather than on costly structures of iron or masonry intended to resist them by massive strength. Masonry is used in parapets only where it is impossible to obtain earth, and then in the form of flat slopes of concrete. Advantage is taken of the great range of the B.L. guns to put their emplacements on high sites, in many cases where with the old M.L. guns it would have been impossible, and of the similarly extended range of howitzers, to conceal batteries for high-angle fire altogether from the sea.

Time warns me to touch very briefly on the question of land defences. It is obvious that the gorges of our great maritime fortresses must be secured from being surprised and taken by a *coup de main*, and this is the more necessary because the modern type of coast battery is itself, as a rule, only slightly defensible against assault from the land side, but the land defences need not, I believe, anticipate any attack by regular siege, and they may consequently be reduced to the minimum required to resist assault by open force, without any sufficient previous preparation by the fire of siege guns.

Here, again, we are at once met by the cry of "Remember Sebastopol, remember Plevna, no permanent works!" But what is

¹ "Hercules" experiments at Portland, November, 1885.

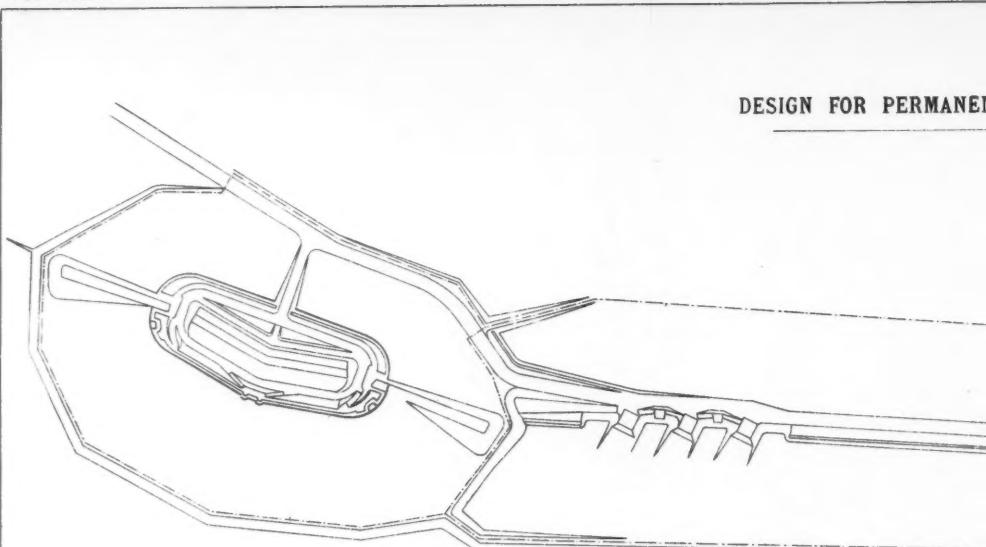
the real lesson to be learned from Sebastopol? Here we see a magnificent defence of a position (the word *siege* is a complete misnomer) carried out with the assistance of a practically continuous line of earthworks which were constructed by the defenders during the continuance of the attack, which construction was rendered possible by the possession of enormous resources in men and guns and by the genius of Todleben. These works were of very slight profile it is true, and were not technically storm free in the sense that there was no really insurmountable physical obstacle to assault, but they held out for nearly a year against a vigorous attack. Why? Because they were defended by a garrison so powerful that it was able even to take the offensive, and practically to reduce the assailants to the position of being themselves besieged in their sea-girt position—and from this we are asked to draw the conclusion that this is the best method of defence for a besieged place. Can any reasonable man doubt what a satisfaction it would have been to Todleben to have found the works at Sebastopol, such as they were, ready to his hand, rather than to have been obliged to build them under fire with enormous loss? Can anyone doubt that if it had been a real *siege*, and the place invested, the garrison (any possible garrison) would have been utterly incapable of bearing the enormous strain of this work in addition to their everyday duties of resisting the attack? Can anyone, in fact, maintain that it is wise policy to place upon the shoulders of the garrison of a besieged place the enormous burden of constructing the works of defence after the investment is formed, and under fire, instead of having permanent defences ready to hand, the necessary improvements and additions to which (inevitable in an active defence) will afford more than enough of work for the garrison? Sebastopol, Plevna, and many other instances, teach us that an active and bold defence may, and will, do wonders even behind the most apparently feeble works; they teach us the inutility of constructing elaborate works *à la Vanban*; they teach us the value of simplicity of design in consequence of the extreme value under present circumstances of the development of frontal fire; they teach us, in fact, the kind of works we require, but I deny altogether that they teach us that the construction of these works should be deferred till the enemy is at the gate, or that there is any inherent disadvantage in having our bomb-proofs built of concrete instead of timber. And, mark, this is the only difference between permanent and field fortification. It is an absurd fallacy to say that because Vanban, Cormontaigne, Brialmont build or have built works of the utmost complication, and of the most elaborate and expensive detail, that we should therefore build no works at all, but should throw upon our raw garrisons the extra duty of doing so in the face of the enemy; and recollect that this is what this senseless outcry against permanent fortification practically amounts to.

Every Continental nation¹ is at the present moment rushing into

¹ The Belgian Government have ordered 147 turrets for Liège and Namur. The Germans 60 for Metz and Strasburg. French frontier forts also have cupolas.

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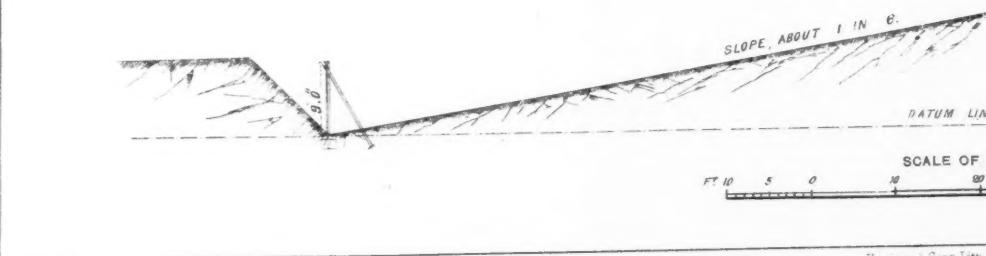
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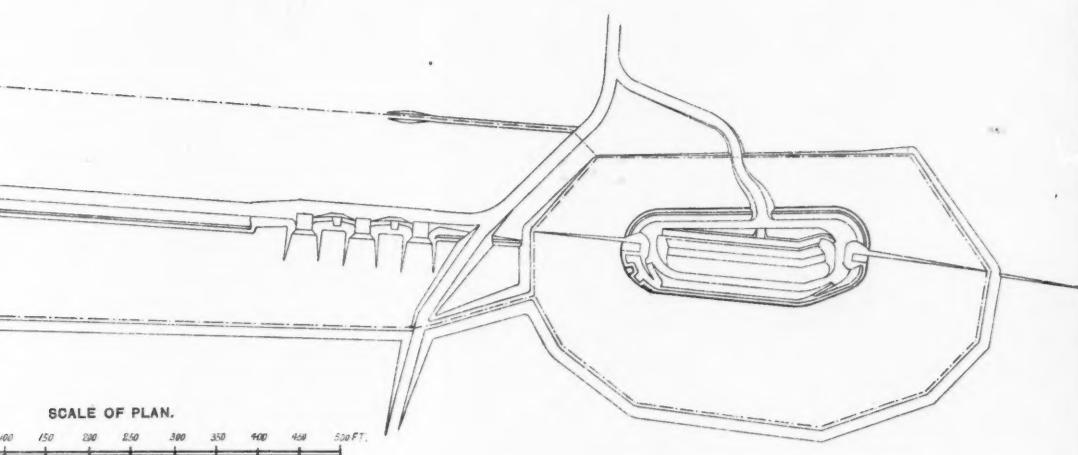
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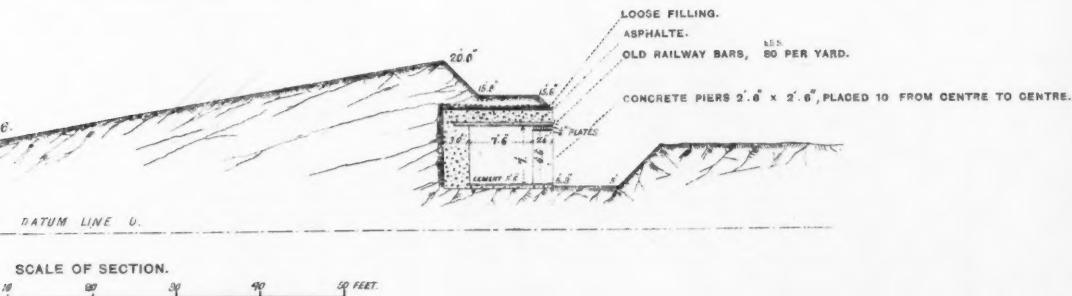
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ROUGH FRONT PARAPET AND DITCH.





iron as the only possible protection of their great fortress guns against the power and accuracy of modern siege trains. Can we suppose that poor and heavily burdened States are doing this in mere recklessness, and without an absolute belief in its necessity; can we believe they are ignorant of the art of war? We in this country, trusting to our practical immunity from the danger of attack by regular siege on the land fronts of our fortresses, consider that we can do what is required of us with less expensive designs; but I say it is not wise to defer the execution of the simple proposals which are brought forward till it is too late—that the moment of accomplished invasion will be too late, there can be no doubt whatever.

In the case of the existing works we are in most cases fortunate in having them placed sufficiently far from our dockyards, they having been designed after the greatly increased range of modern artillery was at all events clearly anticipated, and the works themselves have no more than the almost necessary defects of their period. They are much too elaborate and expensive, as well as too commanding and conspicuous, and they lack that abundant provision of bombproof cover close to the parapets which is the first necessity of defence under existing conditions. They are in fact designed as artillery positions, whereas I believe it would be quite sufficient if they were simply constructed as permanent musketry keeps, leaving the artillery defence to be carried out by movable batteries in the intervals, and were of much lower command, and withdrawn if possible from the forward crest of the position to more retired sites. The defence of the forts would then be chiefly a musketry and machine-gun defence, and they would act as strong supporting pivots to stiffen the defence, and to prevent the enemy from reaping a permanent advantage from any temporary success in the intervals between them.

The great power of holding works given to steady troops by the modern rifle strongly favours this method of defence, but it must be admitted that large and efficient garrisons are required; and though this mode of fighting in a prepared position is favourable to the half-trained troops that alone could be spared for garrison duty, it should be very carefully borne in mind that this lack of training must not be allowed to fall below a certain point, and that the more the troops intended for the various garrisons are made acquainted with the ground where they will have to fight, the better will be the chance of an efficient defence.

I have shown on the board a diagram (see Plate) of a permanent work suitable for the kind of defence I have indicated. This work has been designed for a special position, and partly executed, and its simplicity and cheapness will commend it, I hope, even to the most rabid opponent of permanent traces *à la Vauban*.

A regular siege we have not, I believe, to fear, and I will therefore content myself with a simple protest against the acceptance of Vauban's siege, with Q.F. guns thrown in, presented to us by Captain Stone, as in any way representing the most recent ideas on the subject, and I venture to add that the teaching of our military schools seems to me to be largely responsible for this, as well as for the

false ideas of permanent fortifications which are, I fear, widely prevalent.

Finally, I must very briefly dismiss the important subject of organization of the personnel, which I had hoped to have treated more fully.

In spite of all the improvements in matériel, there is one factor unchanged. The most powerful ships, the heaviest guns, the most scientific devices for directing their movements and their fire, still depend for their manipulation upon human agency; the man remains the same whether armed with a bow and arrows or a repeating rifle. How will this factor be affected by the marvellous extension of the destructive power of modern appliances of war? What will be the moral effect on a fleet of the sudden destruction by torpedo or submarine mine of a battle-ship or two? What on a ship's company of the bursting of large charges of high explosives between the decks? How will the garrisons, not to speak of the civil inhabitants, of fortresses, maintain their moral tone in the presence of similar explosions? And for troops in the field the strain will not be lessened by the greatly increased efficiency of shrapnel and the use of high explosives. These considerations seem to me to point to the necessity for the highest training, the most perfect discipline, as the necessary preparation for success. For the Navy this training more or less exists. The ordinary life at sea, with its continued struggle and watchfulness against the forces of Nature, itself provides a training for war; but is it so in the land forces? Raw troops will be more and more at a disadvantage in combating with trained and disciplined men, and we depend, and must under present circumstances continue largely to depend, upon troops whom it would be affectation to describe as fully trained.

It is said that we shall fight behind works in some prepared positions: but it will be the business of the enemy to manœuvre these raw troops out of such positions, and to be content with partial efficiency on any such ground seems to be less than common sense. Then there is the necessity, already alluded to, of meeting the enemy on landing. This must be done, if successfully, with trained and fully mobile troops, and under a most carefully considered plan of campaign. We require a carefully elaborated organization, under which every man, fully equipped and fully trained, will move at once into his place on a given signal. Have we got it? If not we are practically trusting to a single line of defence, even while we loudly assert the insufficiency of that line, and this in the face of Europe in arms.

May I venture to indicate a policy in this matter? It is very simple, and not very expensive. Its cost would consist chiefly in the casting away of some old prejudices. Barrack square inspection must then give place to real field training, and the Officers of the Army must be made thoroughly professional and be more thoroughly instructed. Our present instruction is too bookish, too little practical, and I venture to think not searching enough. We hold the greatest Empire on earth because we are, or are believed to be, strong enough to maintain it as it was won, by the sword. The truest word spoken

in this controversy is, "A great Empire must be strong or perish." Let us rise to the height of this great cause, and choose, at the sacrifice of some luxury—some effeminate longings after universal peace—some distaste for the militarism of the professional soldier—to be strong, not only in ships and forts, but in the thorough organization and training of our forces for war.

John Bull is fond of boasting loudly that he is a peaceful trader, loving justice, mercy, and free trade; that he regrets the necessity for fighting, and pays other people to take that part of the duty of citizenship off his conscience. The rude way in which these mercenaries swagger round the world is painful to his finer feelings, but still he is very generous, and grudges no expenditure in supplying them with the very best of everything required for their calling; it is simply ask and have. One smiles rather sadly at every repetition of this well-worn boast; for at the best it is hardly a very noble sentiment, and besides it is not quite true, as those who have to ask this very generous person for money know too well. He is inclined to pay neither in person nor in purse; if this great Empire is not to perish, he must do both.

The CHAIRMAN: I have now to invite you to discuss this subject, which has been placed before us in a very able manner by Major Walker, and in doing so I must remind members of the rule which confines speeches to ten minutes. It is especially necessary on this occasion that some mercy should be shown to the audience, as, no doubt, many Officers will wish to address us. I have now great pleasure in calling upon Admiral Colombe to speak, as I know he has come here prepared to do so.

Admiral COLOMB: My Lord, ladies, and gentlemen, I have no wish to compare Major Walker to Goliath of Gath, still less have I, I am sure, any wish to compare the present audience to the hosts of the Philistines, yet I cannot help feeling a little like David on the present occasion, more especially as Saul over the way, at the Board of Admiralty, has not provided me with the official armour which my gallant friend has enveloped himself or his case in. But, gentlemen, I have been down to the brook, and I have got, I think, five smooth stones, which, if time permitted, I might endeavour to sling. But I am in this difficulty, my lord. You have rightly drawn our attention to the ten minutes rule. I am quite sure that those who listened first to Captain Stone's paper, then to mine, and now to the very able paper we have had to-day, must be well aware that what they are discussing are the fundamental principles of the defence of this Empire. We are spending 34 millions ostensibly on defence, and whether we are rightly or wrongly spending it appears to me to depend upon whether we get the right or the wrong answers to the paper which has been read to-day. The expenditure of the Army and Navy are interdependent, but the discussion which has hitherto taken place over this question shows no principle existing between the Army and the Navy, in the matter of defence. Both Services work independently. The Navy, as we well know, officially declined to have anything to do with defence: it says that is the War Office business, and the Army accepts that position, and goes to work to defend on the principle that the Navy is either always away, or always helpless under its shelter. The case seems to me worse since the reading of this paper, because what it has disclosed, coming from the source it does, is that the operations of naval war are not well understood by those who are preparing to defend the country against them. The language that I have been using of late, and especially the language that I used in my last paper, is not understood: it is paraphrased and altered without those who paraphrase and alter being aware of what they are doing. That is present in a very remarkable degree in this paper. I have to thank the lecturer for the paper—I am delighted that it should have been

read. I should welcome more papers of this character, because I think that we are not to the bottom of the question by a very long way, and I have to compliment him on his vigour and earnestness in the composition of the paper. I have to thank him most sincerely also for admitting the great principle that our appeal must be to history, or, as Professor Laughton has better put it, "to experience." There is no way that we can get to the bottom of any of these questions, except by the experience of the past. And I have to thank the lecturer also for what I consider a very marked and clear attempt to get on to my ground; yet so difficult has he found it to understand what that ground is, that he has most freely both misstated and misquoted. His six postulates, as he puts them, are far from any of my expressions, and my trouble is this, that until I have in some degree corrected the misstatements and the misquotations, I find it would be very difficult for us to proceed to a general discussion. And then there is another point. I feel that it is exceedingly necessary for us to guard ourselves in the language we use, and to keep in the icy atmosphere of scientific discussion. There are one or two expressions, if I may be allowed to say so, in the paper which has been read, which might if pursued tend to get us away out of that icy atmosphere. And I want to say this, that from my side, and as far as I understand what the discussion ought to be, it certainly is not Navy against Army, nor has it anything to do with any question of collision between the two Services. I am able to say that myself, because I have received encouragement from many military Officers, and from a few whose names even I did not know, and some whom I had not spoken to previously to the reading of my last paper, have said to me, "Do not you let it be said that you are in any way attacking the Army. We see quite well that it is not so. We see quite well what you are driving at. We see that the great question is as to the right division of labour between the two Services, and there is no question of any sort of rivalry." My position is, that I have such a feeling for the Army, so strong a sentiment with regard to it, that, as far as I can measure my own thoughts, the prevailing impetus which has driven me to this position is a brother's feeling for the army of Marlborough, of Wellington, of Lord Raglan, Lord Clyde, and that magnificent fellow Outram, of whom I never can think except as side by side with Nelson, and your own army, my Lord, in Egypt. Now I cannot bear the thought of a thing which seems to me likely to take place if men feeling and thinking as I do, do not come more to the front and state as far as they can what the position is. I greatly fear the shutting up of this magnificent Army all over the world in useless garrisons—garrisons which, if we are not guarded, may be unnecessarily large. I do not say whether they are or are not necessary, but I do say that they may be, if we do not take care, unnecessarily large, and that the Army may be greatly hampered by the shutting up of an enormous force inside fortresses. And now, my Lord, upon that I must express much regret that you did not see your way to take the chair at both sides of the discussion. I was very anxious that a military Officer should preside, and I am very much obliged to Sir Frederick Stephenson for presiding at my lecture, because that tended to keep us in the icy atmosphere, to prevent any question arising between the Army and Navy, and to keep us to the purely scientific question of the division of labour between the two Services. Now you see the position I am in. I am in the hands of yourself and the meeting; but to answer the paper will take time, and I do not see that the general discussion can go on until I answer categorically, at any rate so far as the misstatements and misquotations are concerned. But I have written the reply, and I thought it might be a possible way out of it if the discussion could be adjourned and these replies could be printed and circulated previous to the full discussion. However, of course I am quite willing to go on. I am in the hands of the meeting altogether. I can now just make the one or two general observations, and prepare myself to ask the Council's permission to read a paper fully dealing with that before us.

The CHAIRMAN: My own view would be to exactly follow out what Admiral Colomb has proposed, that is, that he should now continue the interesting speech which he has begun, and leave the question of printing any larger paper that he may have to the discretion of the Council.

The question was then put, and it was agreed that Admiral Colomb should continue the summary of his written replies. These will be found in full below.

General Sir Lothian Nicholson: It appears to me, my Lord, that we have heard what I may call a second paper, and it is hardly fair to those gentlemen who want to join in the discussion that they should be called upon not only to answer Major Walker, but to take up the cudgels also with Admiral Colomb. Therefore I should propose, with all due deference to the Council, that the replies (or paper) which Admiral Colomb has been kind enough to read in answer to Major Walker should be printed and circulated in due course, so that the members who have done us the honour of being present to-day can have an opportunity of discussing the two together. I think that would be a simpler method of doing it, because to answer it now the poor man will be confused between Major Walker and Admiral Colomb, and he will not know which is which, and all the re-explanations which Admiral Colomb has been kind enough to give us, and which I confess have puzzled me rather more than I was before, will be still more puzzling to answer. I think that, my Lord, is the only way out of the difficulty.

Colonel BRACKENBURY having seconded the proposal, which was agreed to, the meeting was then adjourned to May 9th.

CATEGORICAL REPLIES TO MAJOR WALKER'S PAPER: "ON FORTIFICATION AND FLEETS." BY REAR-ADmirAL P. H. COLOMB.

Extracts.

"England is the only civilized country
"where at the present time it is possi-
"ble to stand up and to deny, with any
"chance of acceptance, the utility of
"permanent fortification."

Replies.

I. I do not myself deny, and I never met any one who did deny, the utility of permanent fortification.

II. An article in the *Avenir Militaire* of the 12th April, signed by a General Officer, says that in the defence of the French coasts by fortification they are alternately swayed by two totally opposite currents of idea. Sometimes they endeavour to fully protect every place liable to attack or simply accessible; sometimes—frightened at this dispersion of resources, forts and batteries are sacrificed in order to take them to pieces and reconstruct them, to the great detriment of their finances.

This Officer thinks the French will be right to abandon all the batteries intended for the defence of open roadsteads, and says that the attempt to be everywhere strong will end by leaving them everywhere weak.

III. From an American source I learn that criticism has arisen from the fact that the Board of Fortification has proposed an expenditure of 11,000,000*l.* on fixed defences without any provision for the garrisons.

I. The average Englishman voted 11,000,000*l.* for fortifications in 1860, and 3,000,000*l.* 1887.

II. The whole of the great commercial ports have recently joined to urge the Government to erect fortifications—rejecting with contumely the Govern-

"The average Englishman looks with suspicion on fortifications."

Extracts.

"Admiral Colomb, as I understand him, withdrew so far from the position . . . as to admit the usefulness of fortification within certain limits—only to object to its employment on a large scale."

"Admiral Colomb, appealing to pre-judice by the platitude, 'Britannia *needs* no bulwarks,'" &c.

Replies.

ment counter-proposal to introduce local naval defences to keep the ports open.

III. All the early part of last year and the whole of 1887, the provincial press teemed with articles demanding fortifications, and condemning my views whenever they got them—which was constantly.

IV. The whole demand for the coaling stations is fortification—not a word is said for keeping those ports open.

V. The U.S. Journal in the first thirty volumes contains forty-three papers referring our defence almost exclusively to fortifications. Not a single paper referring it exclusively to naval means, and only two or three admitting the Navy to a share.

VI. It is perfectly well known that for some years back the Admiralty has systematically refused to concern itself with any defence of territory, and it is allowing, at this moment, all our great commercial ports to be prepared for the closure by submarine mines.

I. In my paper I said: "The importance of the question I raised, and the difficulty in dealing with it, spring from the fact that, *prima facie*, no one denies the value, if not the necessity, of a certain amount of local defence for the ports of a maritime Empire. But then no one knows where to stop."

II. I had, therefore, nothing to withdraw from. I pointed out in my reply that I had no idea of leaving any port absolutely defenceless. Meaning clearly that it was naval defence which was first required.

As Sir John Colomb said twenty-two years ago: "Our object should be, to ensure the safety of those ports in our possession, and to afford protection, *not only to them, but to as great an area as possible around them.*" "Protection of our Commerce," p. 17.

I. This is a misquotation and, therefore, a misunderstanding of the language.

I was making a statement, and appealing to nothing, I said there were three periods only when there was a demand for fortifications—the Martello Tower time, 1860, and now. "At all other times," I said, "Britannia *needed* (not 'needs') no bulwarks," &c. I meant, of course, that this was Britannia's opinion. I said nothing about mine,

Extracts.

"He asserts that there is . . . no fear of any territorial attack, not only on the shores of these Islands, but even on any part of the Empire."

Quoting "Times" of August 30th, 1887.—"Ten or twelve guns can be mounted, even in War Office cupolas, for less than the cost of a single iron-clad."

Quoting me in "Manchester Courier," on destruction of our trade by enemies' cruisers, says: "Where were our superior fleets? Why was there not a superior force present on every occasion to save these British ships?"

"Every important base and every naval arsenal, if left undefended by fortification, will have to be watched and defended by ships told off for the purpose and chained to the port."

"Admiral Colomb's assumption that such cruisers would not attack undefended ports for fear of interruption, is altogether untenable."

"Naval history may answer, 'No,' but what would be said by his superiors to a naval Officer in command of a powerful modern cruiser . . . who should 'refuse,' &c.

Replies.

I have never said any such thing. I have always held that we are running the greatest risks. My fear is that belief in fortifications might blind us to the risks.

I. As used, this is a misstatement of the fact. Ten or twelve guns mounted in cupolas would have no effect in *keeping the Thames open*, which is the work which has to be done, and might be done by a single ironclad.

Commerce is not directly protected by "fleets" unless they are used in convoy. Fleets have nothing to do with the case in point. Fleets are compact bodies to operate against similar compact bodies. Commerce must be attacked by scattered cruisers, and, if no convoy, defended in the same way.

My fear is, that the money which should go on cruisers might go on earth, stone, and iron walls.

Certainly, whether or no. Such ships are absolutely necessary to keep the port open, whether there are fortifications or not.

The Germans sent out the only cruiser they had in 1870. She captured French ships off the Gironde, and nothing but naval force on the spot could have prevented her.

Where have I assumed any such thing?

I have said I thought that five battleships would not. I have always held that cruisers might, if there were nothing afloat on the spot to stop them.

Naval history hardly answers "No" as to single ships and light attacks.

It only says distinctly "No" as to the organized attacks by fleets. But it must be said that, while its answer is positively "No" in respect of the organized attacks by fleets, it is not so positively "Yes" in the case of cruisers belonging to the inferior naval Power which does not pretend to the command of the sea. And even in the former case the light raids are made, not on the port, but on the shipping supposed to be protected by the fortifications of the port.

Thus Cushing makes his way by night in a steam-launch up a river to Plymouth, and torpedoes the "Albemarle," lying alongside a wharf.

Velverton, with "Arrogant" and "Hecla," penetrates seven miles up a creek to carry off ships supposed to be

Extracts.

" . . . The common-sense of our
" rulers who have fortified Plymouth."

" If reasons have been given for refusing to believe that even the most powerful fleet in the world can ever keep the coasts of the home islands entirely free from the enemy, how much more will it be possible to protect every dépôt and dockyard throughout the world?"

" Sir Phipps Hornby and Sir John Hay both show that even when present programme is complete, we shall still be very far from strong enough at sea."

" Is this an encouraging time to ask us to put all our eggs into one basket, 'the Navy'?"

" But since it is admitted that until the Fleet is perfect, and indeed after it is perfect, there will always be a possibility of some of the enemy's ships breaking loose and escaping the blockading squadron of the superior Power, it follows that these ships, which may be of most powerful types, and may be found in any sea, *can only be prevented from making disastrous raids on dockyards or commercial ports by the maintenance of efficient fortifications kept up to date defensively, and armed with effective guns.*"

Replies.

protected by the fortifications of Eckness.

On the other hand, Lyons, in the "Miranda," proceeds thirty miles up a river to the fortified town of Kola (White Sea), with the purpose of demanding its surrender; and he burns the place. But in all these cases the sea was commanded behind the attacking force.

The lecturer is wholly out of it in confusing the operations of a cruiser and a fleet.

Is Plymouth fortified against a cruiser?

If so, the method is rather expensive. What reasons?

Reasons may have been given to show that light attacks will be made if not provided against by light defence on the spot.

But considering that the mere threat of an opposing fleet has kept our shores inviolate from heavy attacks for 300 years certain, it seems a large order to doubt its efficacy now, even with the abortive attempt on Bantry in full view.

Quite so.

But we dropped from our sea strength 1,600,000*l.* in the years 1887 and 1888, and we put on to our fort strength at the same time 3,000,000*l.*, and all that is to be dragged after it in the way of ammunition, garrisons, and supplies.

The only question arising is whether this was a wise proceeding. But no answer is given.

The object of my paper was to elicit such an answer.

I am not aware that I have made the request.

But I have asked to be shown the exact value of putting the eggs into the fortification basket. And I pause still for a reply.

The very first thing we should have to do on the outbreak of war would be (1) to watch the enemy, wherever we knew him to be, with at least equal force.

(2.) To concentrate remaining force at the points where our shipping congregates. And I say this, having been Chief of the Staff to the Commander-in-Chief in China when we were actually contemplating war.

In the first instance, there would be nothing else to do.

We should be bound to assemble at ports of call and coaling stations, and we

Extracts.

"The crucial test of the truth of this proposition is stated by Admiral Colomb to be the conduct of the French Baltic fleet during the Franco-German War."

Replies.

should not move thence except on intelligence of an unwatched enemy.

How can it be said that the *only* way of preventing disastrous raids on dock-yards and commercial ports is by fortification?

The inferior naval Power does not usually attack territory.

None of the Confederate cruisers ever attempted a raid on any port.

Even the "Huascar" confined her work to attacking the ships of the Chilians. She never, I believe, even bombarded a place. That was all done by the superior naval Power—Chili.

I made it no "crucial" test. I merely said the conduct of the French in the Baltic followed the clear rule of naval war.

A low opinion of my intelligence must have been formed if it is supposed I could have put such a statement of fact forward without full warrant.

My authority is René de Pont-Jest, who wrote in the *Moniteur Universel de Tours*, in November and December, 1870, clearly under the inspiration of Count Bouët-Willaumez himself. The writer describes himself as: "... envoyé officiellement auprès du Vice-Amiral Bouët pour suivre les opérations maritimes." He describes how a council of war was held on the 12th of August, and a decision come to thereupon to bombard the fortified town of Colberg on the Prussian coast, which was one of the few places accessible to an ironclad fleet without necessary appliances for an attack on territory. Then he says—Bouët's fleet being in Kioge Bay: "Il restait donc Colberg, et le Vice-Amiral Bouët se préparait à quelque démonstration sérieuse contre cette ville, lorsqu'il reçut le 13 Août, dans la nuit, une dépêche qui lui annonçait que la flotte Prussienne était sortie de la Jade et remontait la côte du Jutland pour pénétrer dans la Baltique." Then he says: "En présence de cette éventualité, le Commandant-en-chef de l'escadre n'hésita pas un instant; il rassembla à la hâte ses bâtiments et se dirigea vers le Grand-Belt pour s'opposer au passage des vaisseaux ennemis et leur offrir le combat."

De Pont-Jest then goes on to show that this turned out to be a false alarm, for that Admiral Fourichon was watch-

Extracts.

"In 1854 the combined English and French Baltic Fleets amounted to 18 ships of the line and 9 steamers. . . . The Admirals proceeded to attack the Aland Islands," &c.

Replies.

ing the Prussians with seven ironclads. After a pause the idea of bombarding Colberg was again taken up, and the fleet got as far as Arkona, anchoring there overnight, and intending to proceed to bombardment next day. Here they suffered much from a sudden gale of wind, and were in fear for the safety of the ships, especially the "Rochambeau." Then, says the writer: "La machine tint bon, heureusement, et le 'Rochambeau' parvint à rallier l'escadre, qui se dirigea sous Kioge-Baie. Colberg, une fois de plus, a été sauvé, car à peine au mouillage, le Vice-Amiral Bouët fut informé que l'escadre du nord était entrée à Cherbourg, que la Jade était débloquée, et que très-probablement la flotte Prussienne en profiterait pour pénétrer dans la Baltique, afin de l'y surprendre."

This is the most astonishing misstatement of fact. I will take the English Fleet alone. This consisted of at least—

(1.) 18 sail of the line, of which at least 12 were steamships.

(2.) 5 steam frigates.

(3.) 14 steam corvettes.

(4.) 4 steam sloops.

Ships employed at Bomarsund (English) were about—

3 steam line-of-battle ships.

2 steam frigates.

4 steam corvettes, and other steamers, leaving at least 10 steam sail of the line, 3 steam frigates, and 10 steam corvettes to watch a Russian Fleet which had not a single steam line-of-battle ship in its ranks, and only some nine small steamers all told.

But the wonderful infelicity of producing such a case can be readily seen on even a hasty perusal of Earp's "Campaign in the Baltic." It is there shown that notwithstanding the real impossibility of a sailing fleet of line-of-battle ships threatening the most numerically inferior group of steam line-of-battle ships, and notwithstanding the fact that Sir Charles Napier was informed by his Admiral in the Gulf of Finland, at the head of five steam and four sailing line-of-battle ships, that the westerly wind must prevent any move on the part of the Russians, yet he expressed himself to the French as seriously discomposed at the idea of their withdrawal from the second

Extracts.

"Take now the case of Gibraltar, as stated in Admiral Colom's paper."

"Then there is the French invasion of Egypt in the face of the hourly fear of interruption by a fleet, which events proved was quite able to hold the command of the sea."

"If Count Bouët's action in the Baltic in 1870-71 was paralyzed by the inferior Prussian Fleet at Wilhelmshaven, what was the use to him of his command of the Baltic Sea?"

"A fortified base confers no advantage upon a fleet."

"It does not give freedom of offensive action . . . because the port not only requires to be locally protected, but also to have its communications kept open, and as the land defences cannot admittedly do this, they are utterly useless, and the fleet is just as much bound to the port as if there were no land defences."

"What we have admittedly to fear is the breaking away of one or more of

Replies.

covering force which he had apparently assembled at Ledsund.

My own words were, "We may indeed say that but for her fortifications Gibraltar would not now be in our possession."

Why slay the slain?

This is a wonderful misstatement of the facts of history. (1.) Nelson entered the Mediterranean with only three sail-of-the-line, two frigates, and a sloop on the 8th May, 1798.

We had then no other force in the Mediterranean, and the rest of our Fleet was tied up watching the Spanish in Cadiz.

Napoleon was ready to sail, and never knew even of these six ships, he had seventy-two war-ships himself, and he sailed from Toulon eleven days after Nelson entered the Mediterranean, but before Nelson had ever come in sight of Toulon.

Nevertheless, so tremendous was the risk, that on the 22nd of June, at night, Nelson, then off Cape Passaro, actually saw two ships of Napoleon's Fleet, and if this seeing had only happened an hour or two earlier, Nelson would have perhaps captured or broken up the whole expedition of nearly 500 sail.

He had not got the command of the Baltic Sea unless the Prussian Fleet was masked. The unmasking of the Prussian Fleet took away from him the command of the sea which was necessary to permit him to make territorial attacks.

I have never said this. On the contrary, I showed how Brest and Toulon always gave safety to the French fleets.

The mistake is in supposing that a fleet can be ready for offensive operations and afraid to leave an unfortified base at the same time.

The thing is impossible. If the fleet is strong enough for operating against the enemy's territory, the fact is sufficient to guarantee the safety of the port it leaves behind.

But this fact will not suffice to keep the port open, because the closing is work which only requires light ships, and therefore light ships must be prepared at the port in answer.

There is no reason to particularly apprehend the attack on undefended

Extracts.

"the enemy's powerful cruisers, who, if there is any important port left undefended, will certainly make a raid upon it"

" or else a temporary loss of command of the adjoining sea by some naval disaster; in either case the port attacked will necessarily be closed while the enemy is in the vicinity"

Replies.

ports. These cruisers would attack shipping in preference, as much more profitable to them and injurious to us. And the ships escaped would have to be followed up, no matter what they were going to do.

This appears to be the nearest approach to getting on my ground.

I suppose it is meant that if the naval force stationed to keep a port open is attacked by a superior force and has fortifications to retire behind, it will be in a better position than if it had not.

According to the nature of the port and its geographical conditions this would be so, and any ports fortified on this principle would, I think, be reasonably fortified, provided the naval force is not stinted for the purpose.

Whether the port itself will remain uninjured is no doubt another question. If the enemy's naval force is superior in attack, it won't. The question will still remain just the same as ever, whether, seeing that the naval force is sufficiently strong will both protect the port and keep it open, and that the fortifications will in no case keep the port open, and may not be strong enough to prevent attack, it will not be better to increase the naval force and decrease the fortifications? This is a point open for careful consideration before money is spent either way.

Geographical conditions would probably govern; but a decision come to after so considering matters would be entirely what I would wish.

The whole question is confined to small ports and light attacks and defences.

If the attacks were heavy and required preparation and time, then the principle of the flanking fleet comes in.

But it is certain that it takes a good deal of fortification to stop a light attack by an enemy which has command of the sea. Witness the "Hecla" and "Arrogant" some 7 miles up a river at Eckness, in the Baltic, in 1854, and the "Miranda," at Kola, 30 miles up a river in the White Sea, as already mentioned.

I should say the question—the general question—in all such cases as this, is the mode of procedure in arranging the defence. I should say: First, the naval force necessary to keep the

Extracts.

Replies.

" Suppose an enemy's fleet shut up in Brest succeeded in forcing the blockade with even one or two powerful swift cruisers. . . . What then would happen? Why the blockading fleet must inevitably return with all speed to protect its threatened home ports, thus releasing the bulk of the enemy's concentrated fleet for any mischief they can compass, while if those ports are secured by efficient local defences, they may be left in safety to their own resources; and the escaped cruisers to the tender mercies of the cruisers of the superior naval Power."

"Imagine a blockade of Toulon with an unfortified Malta. What happens? We must, as is admitted, presume the possibility of the escape, at all events, of a part of the blockaded fleet; anxiety for the fate of his base at Malta, left to the mercy of an unknown force of escaped vessels, will undoubtedly raise the blockade."

port open; secondly, the garrison proper to provide against a *coup de main*; thirdly, the fortifications which may be proper to strengthen the hands of the garrison, and support the naval force in case of superior attack.

Where I suppose we are wrong, is in using a different procedure and saying, 1st, the fortifications; 2nd, to assume no naval defence; and 3rd, to let the garrison come nobody knows where from. I have never seen anything but what assures me that we now go to work in this latter way.

This also seems an honest attempt to get on to my ground. But there is terrible confusion of thought and idea, generated, I think, in part by not understanding that when Admiral Baird raised the blockade of Berehaven because some ships had escaped, he feared not an attack on his base—Milford Haven—but a superior force attacking Admiral Rowley's fleet.

Blockading battle ships do not raise the blockade of battle ships because cruisers have escaped. You might as well break up the camp of an army corps to intercept a squadron of cavalry.

The cruisers that you must station to keep your ports open would protect them from cruisers' attack.

And this the lecturer himself declares in the last sentence.

No one that I know of wants to unfortify Malta—but a great many think that enormous sums are wasted on Malta fortifications from not understanding the conditions of naval war.

If Toulon were blockaded, there must be naval forces left at Malta to keep it open, else it may be blockaded by the light forces of the enemy. Therefore, whether fortified or not it would not be open to light attacks.

If the Admiral off Toulon finds that heavy ships are escaping, his fear could not be Malta, even if Malta were only lightly fortified—it would hardly be Malta if Malta were not fortified at all. In the first case he would know the enemy would not attack Malta for fear of being caught by a detachment of his ships. In the second, heavy ships would not be sent.

What he would fear would be some combination to attack some other British Fleet—that off Brest perhaps.

*Extracts.**Replies.*

He might very likely detach a force to Gibraltar with orders, if the enemy had passed, to follow him up and to reinforce the Brest Squadron.

If Malta were unfortified and the Admiral found light ships escaping, he would very likely secure Malta by sending some light ships to reinforce those already keeping Malta open. But he would be much more afraid that the ships escaped were after commerce.

If his fleet were properly prepared for modern blockading operations he would know what vessels had escaped.

This is not very wisely said. Bouët-Willaumez, in the Baltic, had his open bases at the Great Belt, and at Kioge Bay, following the old practice exactly. He was aware of the dangers of raids and was somewhat inconvenienced by the necessity of having a guard ship when he was so short, but that was all. And Bouët had no sort of proper force for blockading.

It is well known, as I said in my paper, that one of the reasons why Port Hamilton was abandoned was because for the blockade of Vladivostock it was too far off, and it was preferred to have an undefended base nearer. Malta would be too far off to be the base of the blockading fleet off Toulon, though for repairs and docking it would be used.

I have never explained the words away, for they were carefully chosen words, long used by me, and still used to express the same idea.

I have explained only that the words meant what they said, and could not be supposed to mean something else.

I have not said that they meant "an attack by troops landed from ships." If I had meant that, I would have said it. But I have said that the words were chosen in order to cover the invasion of the Crimea.

The words mean what they express exactly, namely: every form of attack which can be made from the sea with the object of reducing the place: and they cannot be narrowed.

But even then my words are misquoted. I am made to say "Fortresses have never successfully resisted an attack from the sea."

I spoke of the experience of steam wars, and said, that in steam wars

Speaking of the supposed advantage which the superior naval Power has of refitting under fortifications, which I have shown that history does not claim, he goes on: "This is, in fact, one of those points where a failure to bring prominently to notice the altered conditions of naval war vitiates the entire argument."

My expression "attack from the sea."
"I understand Admiral Colomb has explained this away by saying he meant by attack from the sea, an attack by troops landed from ships, as, for instance, at Sebastopol."

Extracts.

"The most hazardous statement made by Admiral Colomb is that contained in his letter to the 'Times' of 11th March, in which he endeavoured to prove the superior durability of ships to forts, with a view to showing the absurdity of spending money on the latter."

"The ships built, beside the Martello towers (before Waterloo) lent themselves to the discoveries of science," &c.

"The fortifications of 1859-60, &c., are now things of the past."

Replies.

"They (fortifications) have never stood a determined attack from the sea; they have never given, or restored the command of the sea; but they have sheltered beaten and inferior fleets, small and large, just as they did in times gone by."

What I should have liked to have had is, cases in steam wars that I may have missed, where determined attacks from the sea left the attacked place intact when peace came.

I had in my mind the fall of Sebastopol, and the astonishing power of the attack from the sea, shown in the American Civil War.

I did not care to press the conclusion too far, but it certainly seemed, and seems, to me that there were no parallels for these things in sailing naval war, and that steam seemed to have wonderfully facilitated the attack from the sea on fortified places.

I did not endeavour to prove the superior durability of ships to forts; I had no view of showing the absurdity of spending money on the latter—both of which things are plain on the face of the letter.

And the lecturer has interpolated two words—"before Waterloo," when ostensibly quoting me, which I did not use.

Lord Randolph Churchill had written a letter to the "Times" opposing the naval programme, and declaring that the ships would be obsolete immediately, and instanced the case of fortifications to prove it.

I wished to meet this argument by showing that ships did not really grow obsolete as rapidly as he claimed. It was Lord Randolph, not I, who made fortifications the standard of comparison.

I was thinking of the "Hastings" 74, designed and laid down in 1819, the ship I served in in the Baltic; and of the "Russell" 74, laid down in 1815, our "Chummy Ship" as the blue-jackets called her. Both of these were then steamers.

But the words "before Waterloo" are not mine, for my impression was, and is, the building of Martello towers was continued long after 1815. In this I may be wrong.

I have no knowledge of fortification—I have made no study of it, and do not

Extracts.

"It will no doubt be most advantageous, as has been recently pointed out by a distinguished naval Officer, to have ports secured by coast defences, into which ships" (trading ships) "can run if pursued, where they can assemble in security, waiting convoys," &c.

"If, then, Admiral Colomb's conclusions are wrong, wherein lies the fallacy of his argument? It is, I think, two-fold; in the first place, the command of the sea claimed for the superior Power is an absolute command at all times and in every place, "no possibility of weakness or failure is admitted."

Replies.

presume to express an opinion on so technical a matter.

Captain Stone had read a paper devoted to proving—as I understood—that the fortifications of 1859-60 were obsolete, and I gathered that to be the view of the large military audience which listened. So I was not surprised to hear Captain Stone, at the reading of my paper, sum up his views by saying that these fortifications were "things of the past," and I was not surprised that the lecturer, who spoke after him, did not at once contradict him.

I know nothing of these things, and did not myself assert anything but what was said. I put the words "things of the past" in inverted commas to show that they were not mine.

On a military subject I bow entirely to military statements, but I cannot correct them if they are wrong.

How are ships to run into a blockaded port which, by the hypothesis, is the condition?

If the fortifications of the port are in operation, there must be an enemy present and that enemy will blockade the port.

What good was Fort Fisher to the blockade-runner captured or run ashore before she got to it?

Fort Fisher prevented the Federals from possessing themselves of the port for some time, but it did not help the trader to run the gauntlet of the Federal ships.

The traders to Charleston would have thought it very odd policy if the Confederates, having the power to drive the Federal ships off, preferred to leave the Federal ships blockading, and to prevent them, by fortifications, from doing more than blockade.

My conclusions are only those of naval history; that is, as is so well put by Mr. Laughton, of naval "experience." The lecturer has only challenged one of my statements on this head—the experience of Bouët-Willaumez. I presume he is now sorry he did so.

The argument that the superior Power is to have, or can have, "an absolute command at all times and in every place" is not the experience of history, and would contradict the facts set out in my paper. It, therefore, cannot be mine.

*Extracts.**Replies.*

My conclusions, as I understand them, go no further than to say that on these questions of the defence of the Empire we should still think as our forefathers thought, and that those who spoke, wrote, and acted amidst the realities of naval war, are much better guides to follow than those who clearly show that they have made no study whatever of naval war, who distinctly avow that the whole thing is so altered—yet without showing how and why it is altered—that we must defend ourselves by guess and imagination and not by the light of experience.

I have no conclusions apart from experience, and in my paper, any conclusion of my own put forward, is done in a tentative way, supposing that while the facts I have collected all point in the direction indicated, there may be others which I miss, showing the reverse.

Not a single such fact has as yet been presented to me from any quarter, only a great store of fact supporting my tentative views.

I am trusting to other debaters to bring out fully the language of those I follow, and especially to compare the language of the Royal Commission of 1786 respecting the then proposal to fortify Portsmouth and Plymouth, with that of the Commission of 1859 on the same subject.

It is a pity that my words should be continuously altered and paraphrased. I must say over and over again that they are carefully chosen and will not bear to have their sense changed.

My real words are, "We seem to be met by the conviction that fortifications can only represent delay."

I have not the least idea of dogmatizing on the point, though I necessarily approach dogma when I find no facts brought forward on the other side.

What about the defence of London?

What then is being done with the 3,000,000*l.* borrowed last year?

Are we sure that it is not mistaken ideas on the question of defence which produce the anomaly of the greatest Navy in the world costing only 14,000,000*l.* a year, while a numerically small army costs 20,000,000*l.*? Fortifications *alone* may be cheap, but I doubt if any of us know what money they draw after them.

"What, then, is the *rôle* of fortification? It is only delay, says the gallant Admiral, and this, in a general sense, we may accept."

"There is no enormous expenditure taking place, there are no gigantic works being erected."

Extracts.

"It will, I believe, be found that the naval opinion in cases of difference was generally in favour of more extensive defences than those undertaken, which were watered down to suit the extravagant soldiers."

Replies.

I think this is most probably true. It is only quite recently that naval men have begun to study the experience of the past in order to draw present lessons. And they have not been aware that all the great men who made this Empire took the views that I take now.

It would not have been possible, for instance, for the naval men who were on the Royal Commission of 1859 to have signed the Report, if they had had the Report of the Royal Commission of 1786 before them.

They could not have agreed to report on the basis of an insufficient fleet at home. But, the Report having been made and accepted, the naval official position has been that noticed by Sir Arthur Hood in the Fourth Report on the Navy Estimates, 1888.

He was asked whether before the Estimates were framed, "there was laid before the Board of Admiralty, by any expert, a complete scheme, showing what were the requirements of the country so far as the Navy was concerned?" And he answered, "No, I have never known such a scheme to be ever laid before a Board of Admiralty." (Q. 4167.)

This would have been considered a strange answer half a century ago, but we have been used to think it not strange because of the general acceptance of the idea put forward for the first time by the Royal Commission of 1859, which is that you must fortify on the understanding that there is no naval force.

From this it was but a deduction to think that defence was a War Office business depending on forts and garrisons, and which the Navy was to shake itself clear of.

And the Navy has never thought that the cost of fortifications and garrisons came ultimately off its own back in a sort of compound interest.

Say that forts and garrisons were established because the Navy was considered unequal to the task of defence. Some of the money to establish them was taken off the already weak Navy. The Navy thus further weakened enhanced the necessity of more forts and garrisons, and some of the money was again taken off the Naval Vote;—and so it is possible to go on in a continually vicious kind of argument till we either overburden the country with expense, or leave her in a dangerous situation.

Extracts.

Replies.

It is obviously impossible to settle the naval requirements unless we first settle what our existing sea-faced forts and garrisons are going to do for us.

If the views we now hold are right—I mean if the views opposed to mine are right—then we may want more forts and garrisons, and less Navy.

If the great men whom I wholly follow were right when they lived, and laid down principles that are right now, then we may want less works and garrisons, and more Navy.

But it is clear we ought to settle it either way before we begin to spend the money.

I have never heard this simile used, and I should be glad to know who used it, for it seems to me a strange one.

But it has a curious family likeness to one I have often publicly used, namely, that the *enemy's coast as a maritime frontier* is like a mountain frontier, and his war ports like the passes out of which his forces issue.

"It has been pointed out that a maritime frontier is in its nature "pierced by well-defined passes, and "impassable at other points—the "mountain passes being represented by "the harbours, estuaries, or beaches "along the coast suitable for the dis- "embarkation of troops."

Adjourned Discussion.

Thursday, May 9, 1889.

GENERAL G. ERSKINE, Chairman of the Council, in the Chair.

The CHAIRMAN: I am sorry to have to inform you that it was impossible for the Adjutant-General of the Forces, who presided at the reading of Major Walker's paper on Wednesday of last week, to take the chair again to-day. He has some important duties which prevent him from being here. In his absence the duty of taking the chair has devolved upon me. We are now about to resume the discussion on the paper read by Major Walker, or perhaps, inasmuch as that paper was a stringent criticism on the paper read on the 1st of March by Admiral Colomb, I may say more correctly that we are about to enter upon a fourth discussion of Admiral Colomb's paper. However that may be, there can be no doubt that we have to discuss a very important question. I have to remind you of the rule of the Institution that speakers must confine themselves to ten minutes, and it is important that we should adhere to that rule, as I believe there are a good many gentlemen who wish to express their opinion.

Colonel C. BRACKENBURY, R.A.: Admiral Colomb, with that extreme modesty which is his distinguishing characteristic, compared himself the other day to David defending the children of Israel against Goliath of Gath. But that illustration was not exactly applicable. In the old story it was Goliath, not David, who was the challenger. I am not aware that either Major Walker or anybody else has challenged the increase of the Navy. On the contrary, I believe that every soldier would do everything he possibly could to obtain it. It appears, therefore, that Admiral Colomb in this case is the attacking party, for he most distinctly attacked the expenditure of money upon fortifications. He will probably say "not

upon some fortifications, but upon others." I must honestly confess that, instead of David and Goliath, he reminds me much more of a cartoon that I saw the other day in which an elephant was trying to hold an eel. It is excessively hard to get hold of what Admiral Colomb really means. I hear his lectures and speeches in this theatre. I read his utterances in the papers, and the articles which are founded upon those utterances, but his explanations are so numerous that I fail to know what he really does mean. However, it is clear that at any rate of this great scheme which has lately been arranged for the defence of the Empire, he attacks that part which provides for fortifications. And this again reminds me of an illustration. The great Jesuit missionary of China, M. Huc, tells how the Chinaman, when he is very sick, sends for a doctor and gets a prescription, every ingredient of which is necessary to make a good medicine. Then he looks over the prescription and says, "What does each item cost?" and if he finds an expensive item he scratches it out, and says, "I won't have that." Well, now all the doctors, naval and military, have put their heads together and prepared a good prescription for the defence of the Empire, which includes ships and fortifications. Why not adhere to it, and why take out one part of the scheme because it costs a certain amount of money? Take care that we do not act like the Chinaman. Every soldier would agree that over-fortifying is a bad thing, and the great reason why over-fortifying is bad, and has always been acknowledged to be bad by strategists, is that it locks up in fortifications troops which would be more useful in the open field. Well now, I ask in this particular case what would the proposal of Admiral Colomb do? The fortifications would be garrisoned as everybody knows almost entirely with militia and volunteers. On the other hand, for the defence of those ports by ships alone, you would have to use some of the finest vessels in the Navy. You would, therefore, be locking up your mobile forces by Admiral Colomb's plan and not by the other. Surely the ships are for the defence of the Empire, and are the most movable and the most powerful elements of that defence. The essence of the Navy is mobility, but to have complete mobility, to be able to go out over the whole world, meet the fleets of an enemy and destroy them, the ships must have a secure base behind them to which they can return. With proper fortifications the fleets would be able to roam and defend our commerce; they would be able, supposing an enemy sails to the east or west, to follow him and attack him there. But if they stick entirely to the defence of our home coasts, what we are doing is to lock up like garrisons the finest mobile forces which we could possibly possess. There is a great strategical danger which Admiral Colomb himself has mentioned in speaking of the French fortifications—namely—that of spreading the defence over a large surface or a long extent of line instead of concentrating the defence for attack or counter-attack, as the case may be, on one particular spot. Everybody knows that to be very bad management; yet according to the schemes which I understand Admiral Colomb to propose it seems that he would have his fleets scattered. He would have some fleets blockading, and we saw only the other day at the naval manoeuvres, what very little chance they would have of blockading with any satisfactory result. One enemy gets out, he goes and strengthens another enemy, and that one gets out too, and very soon you have your own fleet dispersed in various places with the concentrated fleet of the enemy able to attack you in detail. Admiral Colomb appeals constantly to history, and he is perfectly justified in doing so. I appeal to history too with reference to one of his great propositions, that of cutting off the food-supply of the nation, and would ask him when has it ever been done? Can he in any portion of history or any era refer to a time when a whole nation has been deprived of its supplies until the ports of that nation were occupied by the land forces of the enemy? Another interesting question is with regard to the flanking fleet of which Admiral Colomb speaks: he says that no enemy can attack if he has any idea that there is a flanking fleet near him; I think the statement was within 700 miles, or at any rate a case was quoted in which at 700 miles a flanking fleet was supposed to prevent the attack of another fleet upon land fortifications. Now I am very much surprised to see that one very interesting incident has been left out of account or only glanced at, the one example in history of the meeting of two ironclad fleets; I refer to the Battle of Lissa, where the Italians, knowing that the Austrian fleet was within a day's sail, still attacked land fortifica-

tions. It is quite true that the land fortifications beat them off, as I hope they always would do, and certainly ought to do; but at the same time that had nothing to do with the Austrian fleet. I happened to have the advantage of knowing a great deal about that battle, because, although not actually present at the time, I was with the Austrian fleet immediately afterwards. I went over, under Admiral Tegethoff's care, every ship in the Austrian fleet and talked to every Captain. I then crossed to Ancona, and went over the Italian fleet in exactly the same way. The Italian Admiral was kind enough to send me round with his Flag-Lieutenant and allow me to talk to every single Captain of every ship, and from not one of those Captains, either Austrian or Italian, did I hear a single word about the danger of the fleet on the flank. I heard a good many criticisms as to how the battle was lost, but not any reason why they should not have attacked the fortifications. What we soldiers want to do, so far as I understand, is not by any means to take a single ship from the Navy, or withdraw from them one penny which they can possibly get out of the country to spend upon the Navy. The present scheme for the Navy does not even appear to us sufficient from our soldier's point of view, and what we want to do is to come to the aid of the Navy as much as we can, and not so much for the Regular Army to stand within fortifications, but for the militia and the volunteers to aid the fleets, forming as they will the garrisons of the great fortresses, and in that respect standing behind the Navy so as to secure its base of operations. This seems to me the only way to make the greatest possible use of the forces of the Empire. I have only one more word to say, and that will be, if the lecturer will allow me, a word of criticism on his admirable paper, which is, I think, one of the very best I have heard in this Institution. It is with regard to something contained in the very last paragraph, where he is too much down upon a very fine fellow indeed, whom we call John Bull. It seems that many of us are inclined to say that John Bull is extremely stingy and that he won't put his hands in his pockets, that he does not know his own interest, that he will not give money for the Army and Navy. One of the wisest men in Europe, Mr. Delane, the editor of the "Times," who honoured me with his friendship, used always to say, "Do not imagine for one instant that John Bull refuses any money whatever as long as you can only prove to him that there is sense in its payment. If you naval and military men will agree upon any expenditure whatever, and show that it is for the good of the Empire, and not for placing comfortably younger sons, you will find that John Bull will be perfectly ready to pay it whatever it may be." The whole of the Press has lately shown an almost undivided feeling; there has been hardly a dissentient voice; Parliament has spoken almost as clearly though not quite; as far as John Bull is represented by the Press and by Parliament, it is perfectly clear that he is ready to give the money which is required. Only if we soldiers and if Admiral Colombe will rush to the papers and we contradict each other, one side swearing that we do not want fortifications and the other saying that we do, how on earth is John Bull to know which is right? "If the trumpet gives an uncertain sound, who shall prepare himself for the battle?"

Admiral Sir R. V. HAMILTON, K.C.B.: In my reading of history, littoral fortifications have invariably been the resource of the weaker maritime Power against the stronger. To go back three centuries ago, Spain undoubtedly had every right to call herself the mistress of the seas, having not long before almost annihilated the Turkish Navy at Lepanto, and she monopolized the commerce of the world; in 1587, the year before the Spanish Armada, Drake sailed into Cadiz, and destroyed the fleet which was assembled in that port for the purpose of invading England. Two centuries after that Cadiz was well fortified. It was blockaded by Nelson, but Nelson never dared to attack the fleet which was in that port, so that in that instance fortifications were an assistance to the weaker Power. Again, go back to the wars at the end of the last century and beginning of this; while the French coast bristled with batteries, the English coast had only a very few round it, and the concentration of the troops and flotillas for the invasion of England was only rendered possible by the French vessels being able to creep along close in shore under the protection of their batteries. But for those batteries they could not have gone from port to port; had the French been the stronger maritime Power, their concentration would have been effected without the aid of those batteries.

and under the protection of the Navy. Colonel Brackenbury has said that one objection to having too many forts is that it weakens the Army. There is no doubt about it. The Peninsular Campaign could never have been fought but for Trafalgar, which left us mistress of the seas, and enabled the English Army to carry out their operations without any fear for their supplies or of losing their base. With regard to fortifications I will read the words of Raleigh. Raleigh's counsel prevailed very materially in the Council held for the preparations for repulsing the Spanish invasion. He was a soldier. He was Military Commander for the West of England, and he said that without her fleet England could not stop that landing: "We say that an army to be transported over sea, to be landed again in an enemy's country at a place left for the choice of the invader, cannot be resisted on the coast of England without a fleet to impeach it, nor on the coast of France or any other country, except in every creek, port, or sandy bay they have a powerful army to make opposition." There is no doubt that you cannot prevent a hostile army being landed in any country, unless you have a very superior army indeed, and even then it is very doubtful. I perfectly hold that our naval arsenals and coaling stations must be defended. We want these forts and guns to protect the area in their immediate vicinity when our ships are away, protecting what Sir John Columb calls "the wider area." A squadron might chase away the enemy's ships, and being drawn away from the port, one of the raiders might turn back and destroy all our coal stores if unprotected by forts. Lord Howe says: Without a well appointed and commanding navy the British Army and lofty spirit of Britain would be confined to their own shores at home, and become powerless and unknown abroad; their commerce would fall into decay, pass into other hands, and we should be once more reproached as the Britain *toto ab orbe exclusi*, instead of, as now, feared and respected in every part of the world." I think in that respect there can be no doubt, and in strengthening the Navy so as to ensure the command of the sea, we also strengthen the Army, so that it is ready for offensive operations out of the country. I should now like to offer a few remarks upon the lecture, though I suppose in doing so I shall incur the odium of the lecturer, and also of his opponents, because I do not agree with either of them on the whole. That being the case, I am very glad to see a distinguished infantry Officer at the head of this meeting, who will probably hold the balance straight between the fortification and the naval fads, as he knows both Services thoroughly. The lecturer says the British Fleet is not sufficient, because: "In 1810 we had 664 cruisers at sea as against 105 in 1807, and though 19 of the enemy's cruisers were captured in less than a month, still in one fortnight 20 of our ships were captured by the enemy close to our coasts." That is perfectly true. Fleets can no more be everywhere than can the police, and yet we must admit that the police have the burglars and murderers pretty well in hand on the whole; and so did the fleet, as we may judge from the fact that our exports and imports increased from 46,000,000*l.* in 1792 to 90,000,000*l.* in 1815,¹ therefore I apprehend that our naval police had very good hold of the sea-burglars. This increase was accompanied by the total ruin of the trade of France, and that of most of our enemies. During the two years of war with the United States, from 1812 to 1814, their commerce diminished from 50,000,000*l.* to 4,500,000*l.* and two-thirds of their traders and mercantile classes were insolvent. Ours on the contrary increased from 64 millions to 87 millions. Now I will ask the lecturer would any amount of fortifications have saved the capture of those twenty ships, or could they in any way have added to our commercial greatness or the corresponding depression of our foes who were inferior to us at sea? Admiral Colombe has dwelt upon the fallacious conclusions drawn by the lecturer from the Baltic Fleet; in that respect I quite concur with the Admiral. I will not make any further remarks upon it, beyond simply saying the Russians were far too wise, with twenty-two sailing ships, to come out and attack the Allied Fleet of eighteen ships, of which twelve were steamers. Our fleet was far more effective than theirs, although inferior in numbers. The game of Russia was that Sir Charles Napier should knock his head against the stone walls of Cronstadt or

¹ Allison, 1815-52, vol. i, chap. 2.

Sweaborg, and that they should then come out with their fleet to attack him when disabled, but he did not fall into that trap. I do not think the lecturer's illustration of Napoleon's invasion of Egypt a happy one. The defeat of Napoleon before Acre, and the ignominious capitulation of the French Army arose from the French having lost the command of the sea. They were cut off from their supplies and base of their operations. The Adjutant-General of the Forces has made several successful attacks upon Coomassie, Zululand, and Egypt, but I should have liked, if he had been present, to have asked him if he would have made any one of those attacks unless he had been perfectly certain that he had a naval base of operations to maintain his supplies, and to fall back upon in case of necessity. Malta was never besieged. It was blockaded for two years by sea and by land, and fell ultimately from starvation. I should like to ask the lecturer on that point, how long would it have held out against a regular siege, and what sized army would have been required to besiege it in that day? Because I think it is very important with regard to naval operations to know this. I myself suppose that an army of 25,000 or 30,000 at least, with a siege train, would have been, and would now also be, required for the purpose, and if the siege had taken any long time it is very certain that we should have regained the command of the sea, and the invading army would have been annihilated. Another remark he makes is why did not the British Fleet attack the French maritime fortresses? As a R.E. he should know they could only have been taken by a combined naval and military attack. Fleets are built to attack fleets, not fortresses. There are, however, exceptional cases in which they have successfully bombarded forts. The remarks of Admiral Farragut in the United States Civil War are conclusive on that point. He says: "We could pass and repass the forts (in the Mississippi), and have done so, and can do it again when required, and can shut up their fire as often as we like, but we cannot capture them without land force." Another great point made is "that steam is not in our favour." I hold most strongly, and I believe most naval Officers will agree with me, that steam, so far from bridging the Channel, has given us the greatest facility for its defence. There could be no such thing in these days as that Protestant wind (as it was called) which enabled William of Orange successfully to land on our shores. There could be no such thing as the various chances which happened to us when the French landed in Ireland. No matter what the wind is we could certainly insure our Fleet being on the spot in a very short time, and in that respect I agree with Admiral Colom's argument about the flanking fleet being an almost infallible defence of the country, whether superior or inferior. The lecturer mentions the difficulty of landing on an enemy's coast: as he has dwelt on Napoleon's invasion of Egypt, I would remind him that Sir Ralph Abercrombie landed in Egypt, although some of the boats were capsized, and crews drowned, without the ships being able to get near enough to support the landing, and this he did in the face of a superior army. The lecturer also speaks of certain differences between the Army and the Navy. I am happy to say these differences of opinion only exist in London, for the moment we get away from here, and have to act together, there is only one difference between us, and that is a feeling of rivalry as to which shall most effectively support the honour of the country.

Admiral Sir E. FANSHAW, G.C.B.: I wish to make a few remarks upon those parts of Major Walker's paper which refer to our defences against the invasion of this country. Major Walker, in the first part of the paper, expresses his belief that there exists throughout England a very widespread superstition, arising from our insular position, which leads Englishmen to place their entire dependence upon the sea alone as a defence; and he is so confident of this that he thinks it is a fact that the average Englishman regards with the unreasonable suspicion of prejudice and ignorance all those who would enlighten him as to the folly and danger of this exclusive dependence upon the sea. I think Major Walker is mistaken in this belief, because we have seen, during the last thirty years, many hundreds of thousands of Englishmen enrolling themselves as volunteers, with the entire sympathy and approval of their countrymen, for the very purpose of forming a system of land defence entirely independent of the sea defences. But, further on in the paper, Major Walker sketches, with all the precision and clearness of a syllogism, a system of invasion of England from which sea defence is altogether and entirely excluded.

He says that maritime countries afford peculiar advantages to an invading force, because the invading army is able to cross the sea in a compact mass to the shores of its enemy, and that it derives additional facilities in the case of an attempted surprise. England is a maritime country, and the inference is that England affords the advantages to an invading army here specified. The fallacy is so transparent that it is hardly necessary to point out that it consists in including England in the general premiss, whereas England is altogether exceptional, and excluded from it, by the fact that England holds the mastery over the seas that surround it by means of a superior naval force, which is capable of preventing any invading army from approaching its shores at all. But from this fundamentally unsound basis Major Walker draws his conclusions; the first of which is that we must fortify all the harbours and estuaries of our coast, which are specially available for the landing of an enemy, and which that enemy might select as being conveniently situated for his ulterior objects. There are other inferences drawn, but throughout the whole argument there is not the slightest indication whatever that England possesses so much as one single gunboat upon the sea. I will now advert for a moment to that part of the argument in which Major Walker draws a comparison between this facile invasion of England and the more difficult invasion of a country with a mountainous land frontier. I do so for the purpose of pointing out that the Commander of the invading army in the latter case will guard and maintain with the most scrupulous and jealous care his communications with the base from which he derives his supplies. But if any fraction of the army intending to invade England could get ashore here, it would find itself face to face with a bitterly hostile population—with the whole resources of England of every description (I hope previously well organized) concentrated against it, and with its communications hopelessly and irretrievably cut off. In that condition I submit that we may with confidence leave it to be dealt with by the military forces in England. I will only make one more observation. If it be an error—and I think it is a very serious error—to allow our just and confident trust in our naval defences to deter us from organizing in the most efficient manner the land resources of England as a subsidiary force for repelling invasion, it is an immeasurably greater error—a monstrous and fatal error—to ignore, or in the slightest degree to underrate the value of, or not to take every possible means to make perfect, the naval defences of the country.

General Sir LOTHIAN NICHOLSON, K.C.B.: I confess that I rise with extreme diffidence and some hesitation, for Admiral Colomb's explanation and re-explanations have somewhat puzzled me. As I said on first addressing the meeting when the original paper was read, the reduction was one which was *ad absurdum*. The conclusions which I drew then appear to me the conclusions which I shall draw now. Admiral Colomb proposed a theory which I maintain if carried to a logical deduction would lead to the disarmament of our fortresses and the entire demolition of the land forces. (Admiral Colomb: No, no!) That is the conclusion which I arrived at from his original paper. I maintain that that was a just conclusion, though I am answered with "No, no." I still maintain that that is the case, but I am glad to see that Admiral Colomb has somewhat retreated from that position. He began his answer to Major Walker by saying, "I do not myself deny, and I never met any one who did deny, the utility of permanent fortifications." That appears to me to be the whole of our argument; we maintain exactly the same theory. I am perfectly in accord with Sir Vesey Hamilton in every word that he has said, and I am quite certain that there is no military man in this room who does not agree exactly with what Sir Vesey Hamilton has laid down. Beyond that I maintain that if Sir Vesey Hamilton had given this lecture instead of Admiral Colomb, upon the lines which he has laid down now, there would have been little, if any, discussion upon the subject. I accept everything that Sir Vesey Hamilton has said. I accept the fact that the defences of the country are simply to back up the Navy under certain conditions. That is all we say; we say that under certain conditions the defence of commercial ports, of coaling stations, of military ports, is absolutely essential, and we maintain that under certain conditions these fortifications are justified. They are justified, I believe, by the majority of naval men: they are justified entirely by military opinion; but here I would beg leave to say that there is no question of rivalry between the Services. There is a feeling that

words have been used in this theatre to show, or to try to prove, that something of the sort is in existence. Now I maintain that as between the Services there is absolutely no rivalry ; we all want to arrive at the same conclusion. We all want to find out what is best for the country ; we all want to find out what is the best way to spend the money which John Bull will give us, even if we expend money upon fortifications which most of us perhaps would say would be better spent upon additional ships and strengthening the Navy. But, at the same time, I do believe that you may aim at an Utopia with regard to the Navy, and I believe that if you carry out Admiral Colomb's argument you do desire such an enormous increase of the Fleet that the country will never stand it. (No, no.) That is a matter of opinion. I believe, if Admiral Colomb's argument were carried out, you would require three fleets—three classes of vessels. You would require, first of all, large standing fleets to repel the incursions of the large fleets—combined fleets, mind you ; do not let us think about one enemy : let us think of half-a-dozen enemies, that is what we have to be prepared for. It is not that we have only France : it is that we have a possible combination of Russia, France, and possibly a third. That is the position, gentlemen : it is not that we have got only to go across to Brest or to Dieppe, or to one of those places, and blockade them there, but we have to think of a dozen other places besides ; so that I say, if Admiral Colomb's argument were carried out, it would be necessary to have separate fleets to repel possible enemies. He would also require a number of cruisers to keep open the distant communications within a certain zone with our commercial and military ports. And, besides that, we should require a third fleet, which it would be necessary to locate more or less in home waters. That is, I believe, in Admiral Colomb's mind. He shakes his head ; well, very often he shakes his head to very little purpose, because, generally speaking, he climbs down from his position ; that is the impression on my mind. I ask you, is it in the least likely that the country will give you three fleets ? Now I maintain that the fortifications of this country are intended to take the place of the fleets, which must be maintained for the special protection of the ports and dockyards. I do not deny that it is absolutely imperative to this country to have a fleet strong enough to withstand the fleets of three or four combined nations at war against us. I do not deny that it is necessary to have cruisers to keep open communications with our ports, but I do say, in the exigencies of the present time, the chances that swift cruisers give an enemy of getting behind our first line of cruisers would oblige us to place our ports and our commercial centres in a position of absolute safety ; and I say that light fortifications, such as we are now putting up—not the iron forts of years ago, I do not maintain that that is the proper way to do it—but the light fortifications we are using at present do comply with the exact principles that Admiral Colomb lays down. I do not want to detain the meeting beyond my limit of time, but I should like to refer to what Admiral Colomb has contended here. I beg leave to say I do not intend or wish to go into any detailed criticism of Admiral Colomb's paper. I wish merely to point out one or two things. He says : "The whole of the great commercial ports have recently joined to urge the Government to erect fortifications, rejecting with contumely the Government counter-proposal to introduce local naval defences to keep the ports open." A paragraph which follows shortly after that is as follows : "It is perfectly well known for some years back the Admiralty has systematically refused to concern itself with any defence of territory, and it is allowing at this moment all our great commercial ports to be prepared for the closure by submarine mines." That appears to me an extraordinary admission. In one place he says that the commercial ports reject with contumely the Government proposals, and in the other he says the Admiralty systematically refuses. That appears to me to be a contradiction, and perhaps Admiral Colomb in his reply will be good enough to explain it. We know perfectly well the commercial ports have refused. Sir Vesey Hamilton and myself were united in a most friendly way in making these proposals to the commercial ports, and they did certainly, speaking generally, refuse to accept our proposals. As I understand from Admiral Colomb, he rather sums up his argument in these words : "First, the naval force necessary to keep the port open ; secondly, the garrison proper to provide against a *coup de main* ; thirdly, the fortifications which may be proper to strengthen the hands of the garrison and support the naval

force in case of superior attack." I rather agree that that is the line, but it is a very difficult thing to get other people to agree to it too. We should like above all things that the Navy and the Admiralty should agree upon this point, but we cannot get them to do it; that is one of the difficulties, but I do not go so far as the lecturer in the second paragraph, in which he says that we must first of all consider the fortifications: secondly, we are to assume no naval defence: and, third, we have to let the garrisons come nobody knows where from. Well, now, in the first place, the fortifications are based upon certain well-considered ideas; secondly, we do certainly not assume that there is no naval defence, and I do not know anybody who has ever come forward to make such an assumption. I have never heard anybody in this room, or out of it, ever assume that there is no naval defence. The next says: "Where are the garrisons to come from?" That is a point upon which Admiral Colomb is mistaken. I have no hesitation in saying, if he had consulted with the military authorities at the Horse Guards, they would have told him that the garrisons are considered, and that the object of the fortifications is not that we might shut armies up, but that we might let armies loose. That is the great object of fortifications, and I am sorry that a man for whom I have so much respect as Admiral Colomb should have treated the soldiers' argument in that way. Fortification has for its object the setting a field army free. The object of fortifications is, as far as I understand it, to so protect your point of defence as to use as few soldiers as possible, and I maintain that that is the line which we take. We also maintain, as far as I know—and I have some means of knowing what are the theories upon which we act—they may not be perfectly sufficient ones, and I may not be the best expositor of them, but I shall maintain that no fortress is put up, and no battery erected, without, in a certain measure, considering who are the people to have the defence of it. That may not be done in sufficient depth; we must go deep enough into that question, but I absolutely deny that the question of the garrison of fortresses is entirely ignored. I am sorry to have detained you so long, but the subject is an important one.

Colonel A. MONCRIEFF, C.B.: Mr. Chairman and gentlemen, I have a few remarks to offer, although the subject in some cases has been touched upon by those who have preceded me. With regard to this most important discussion I feel convinced that the views of those who have approached the subject from a naval point of view and those who approached it from a military engineer's or land service point of view are much nearer—much more in accord than appears upon the surface. The difference of view which has been brought out so sharply is in my opinion superficial, whereas the agreement is fundamental. Indeed it is but one great subject, and whether approached from one point of view or the other, the land and the naval part of the problem are merely supplemental to each other. I think we ought to feel very grateful to Admiral Colomb for coming forward and stating his case from a purely naval point of view—which is a novelty—in my humble opinion, however, it is from that point of view that this subject can alone be safely approached, although it is generally from the other point of view that the question is taken up, but Admiral Colomb will, I trust, excuse me for expressing my opinion that he has weakened a very strong case by stating it rather too strongly. We know his object in doing so was to provoke discussion. That object has now been attained, and therefore I think we should endeavour to reconcile the two views and try to arrive at a practical conclusion, which will be approved of by both sides, and not create the impression among the less informed public that there is any radical difference of opinion between the two classes of experts. To assist in arriving at that desirable practical conclusion may I offer the following suggestion? It is too often the case that those who speak on this subject talk of the Navy alone as the first line of defence, and of land fortifications as belonging to a second line of defence, whereas military harbours, dockyards, and coaling stations are as much parts of the first line of defence as are the ships themselves. Indeed they are quite as necessary a part of the Navy, as in a previous generation were the sails and cordage required for the fleet. Therefore, if we treat these fortifications, which are absolutely necessary for the Navy, as part of the first line of defence, many of the difficulties which stand in the way of reconciliation might be removed, and there will not, perhaps, be the same differences of opinion. Whatever fortifications can *not* be

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treated in this sense, as a part of the first line of defence, might be, or should be, in the meantime neglected, and those which can be thus treated should be completed and receive expenditure and attention, in direct proportion to their importance as a part of this first line—no more and no less. I do not maintain that all coast fortifications belong to the first line of defence, but there are some positions indicated by naval authority—where a light armament sufficient to repel single cruisers would relieve the Navy materially, and economically, from a duty which falls on it, so far as they do so—might surely be included. I trust some conclusion may be arrived at which will stimulate the authorities to expend at once what is required to complete the first line of defence, and to treat the whole of this as one subject. I perhaps might be allowed to refer to another part of the lecturer's paper which referred to the manner in which the coast fortifications are now carried out. All the types of coast works in existence he divided into three different classes or types, and he mentions as a fact—to this I beg to draw your particular attention—that these defences are now carried out exclusively on the third type. Major Walker mentions that every emplacement now being built throughout the Empire is of this type, which he states is now most in favour. This system or type he informs us "is to take full advantage of the power of modern artillery, in order to disperse the guns both on plan and elevation without losing the power of mutual support, and also to give them the greatest possible amount of concealment by the use of disappearing mountings, and by the assimilation in appearance of the batteries to the surrounding ground." I should like to quote from a paper read by me in this theatre nineteen years ago all but a month, *viz.*, on the 14th April, 1870, in which I recommended the disappearing system for coast works in the following words: "The guns should be scattered so as not to draw converging fire from the ships but to be able to converge their fire on them; all natural advantages should be seized as a means of disguising or masking the exact position of the guns. The guns should be so arranged as that each should have as great an opportunity as possible of using the new powers of traversing conferred by the system, either in attacking ships or in covering the ground in front of other guns. Batteries should be generally well retired from the Channel so as not to be readily approached from ships, and so that the increased precision of land fire would tell to their advantage," and so on. You will observe that the ideas are exactly, and the words almost, the same. In other words, the system now being alone applied is what was formerly known as the Moncrieff system, which was recommended and explained in this theatre nineteen years ago, and officially and otherwise on many occasions both before and since that date. I may also add that I have spent twenty years in pressing forward that system, and what is more important, in providing the means for making it possible. I naturally feel very much gratified indeed to find that the labour of the best part of my life and the persistent advocacy of twenty-five years has resulted in the system which I have so long recommended being the one which is now alone supplied throughout the Empire for coast fortifications, as stated in the lecture, and to see it so universally adopted, and I am proud of having so far benefited my country. It is a much greater change in principle than it seems. Until it was adopted and superseded the two other methods, which change may be said to have commenced about five years ago, through the influence of the late Inspector-General of Fortifications, the system was known by my name. Now that it holds the field, that name is never officially used. While feeling gratified that the disappearing, or more properly the invisible system, is being applied to so many works, I confess candidly that I do not enjoy what you may have also noticed, its simultaneous and complete application to that system's author.

Professor LAUGHTON: There can, I think, be no question that, as Sir Vesey Hamilton has pointed out, the function of fortified ports has been in all ages the shelter of the fleets of the weaker Power; when a nation is strong at sea, forts are useless—of what use, for instance, have our forts ever been? Have the fortifications of Portsmouth or Plymouth for the last 200 or 300 years ever fired a gun in anger? Have they, by their mere existence, ever deterred an otherwise possible attack? From time to time considerable sums have been spent upon them, but they have never been of the slightest use. In 1779, when the most formidable demonstration of the enemy was made in the Channel, the fortifications of Plymouth

were crumbling to ruin, the guns were honeycombed, and the garrison consisted of something like fifty men. The combined fleet of sixty-six sail of the line was off that port, and a large army was gathered on the coast of France waiting to be brought over; but no attack was attempted. D'Orvilliers and Cordova would not venture on any such attack. Why? Because Sir Charles Hardy, with a fleet very much inferior to theirs, amounting in fact to little more than one half, was off the Isle of Wight. That fleet was the defence of Plymouth, not the crumbling fortifications. It seems to me that many Officers, both military and naval, lose sight of the extraordinary power of a fleet in territorial attack. I am not, of course, speaking of the ordinarily understood duties of a fleet for blockade or naval engagement, but as commanding the shore. Now this may be to some extent matter of opinion, but I base my idea on the opinion of experts of the very highest authority. You will, I hope, excuse me if I read one or two of them. The first I shall quote is Nelson, not as to what he did but as to what he said might have been done. He wrote to Lord Keith after the fall of Genoa in 1800: "I say that the British Fleet could have prevented the invasion of Italy (in 1795), and at that time we had nothing to do; and if our friend Hotham had kept his fleet on that coast I assert, and you will agree with me, no army from France could have been furnished with stores or provisions; even the men could not have marched." The fleet, in fact, would have commanded the road all along the coast. Another man who, in some respects, in what we may call partizan war, was Nelson's equal, Lord Cochrane, wrote in his mature age, referring to what he had done in his youth, that he would stake his professional reputation on the assertion that "neither the Peninsular War nor its enormous cost to the nation would ever have been heard of" if he, Cochrane, had had the command of a small frigate squadron in the Bay of Biscay; that it will always be easy "so to harass the French coast as to render any operations in Western Spain or even in foreign countries next to impossible." These seem to me exceedingly strong opinions, though not referring to operations against our own shores: but if it is easy to prevent the enemy from invading other shores, *à fortiori* it must be to prevent them from attacking our own. With reference to these I had noted that remarkable passage from Raleigh's "History of the World," which Sir Vesey Hamilton has already read. But I may trace the same idea at a later period. In 1785 a Commission was appointed to inquire into the proper way of defending the dockyards. This Commission had at its head the Duke of Richmond, the Master-General of Ordnance, and with him were associated seven Officers of the land service and five of the sea service. It would seem from this preponderance given to the land service, that the question was considered from the first as one mainly affecting it. The data put before the Commission assumed that the fleet was away from England for three months, and that preparation was to be made to resist an army of 30,000 men landing from France. The advisability of fortifying the dockyards was formally stated and agreed to; but some of the naval Officers, and especially Captain MacBride, afterwards declared that the Duke of Richmond had acted throughout rather as the guide than as the President of the Commission. That perhaps might be disputed, but it is beyond dispute that the naval Officers on the Commission, including Milbanke, Graves, Jervis, and (though not so formally) Barrington, drew up, not exactly a protest, but an explanatory memorandum which ran in these words: "That our proceedings have been founded on the supposition of the whole fleet being absent for three months, as mentioned in the second datum, and, therefore, that the enemy may bring over an army of 30,000 men with artillery proportionate to an attack on Portsmouth or Plymouth, having three months to act in uninterrupted by the fleet. The bare possibility of such an event we do not pretend to deny, but how far it is probable that the whole British Fleet may be sent on any service requiring so long an absence, at a time when the enemy is prepared to invade this country, we must humbly leave to Your Majesty's superior wisdom, and therefore, whether it is necessary, in consequence of such a supposition, to erect works of so expensive a nature as those proposed, and which require such large garrisons to defend them." That is the opinion of men with the memory of 1779 still fresh in their minds; men too who were familiar with the events of 1759. Our ancestors used to speak of the Navy as the "wall and fence of the Kingdom." In modern times people have got to speak of it as the "first line of

defence." I object *in toto* to the expression. I do not know whether anyone ever heard a German speak of their army as their first line of defence, or of their Navy as the second line. They have a navy, and one of which they begin to be justly proud; but to speak of it as for the defence of the country, to be compared with their army, I cannot suppose it ever entered into a German's head. Now, I venture to think that the phrase of our ancestors was a correct one; but even if we are to adopt the new-fangled phrase, if we are to consider the Navy as merely the first line of our defence, surely it is on the first line that our principal expenditure should be made. Without now going into the detail of the Estimates, I am under the impression that the ratio of expenditure on the two (so-called) lines of defence is exactly the opposite; and that year after year the expenditure on the "second line of defence" exceeds that on "the first" by several millions. Major Walker, in his paper, seems to consider that he scores a point by saying, that even with the additional 12½ millions proposed to be expended on the Navy in the next four years, it will still be very far short of the ideal described by Sir Geoffrey Hornby, Sir John Hay, and others; but even with that fourth part of 12½ millions added to our naval expenditure, the annual sum spent on this "first line of defence" will fall far short of that annually voted for the "second"; and I venture to say that if for the last twenty years the 5 or 6 millions by which the Army Estimates annually exceed those of the Navy had been spent on the Navy and on what we are daily told is our "first line of defence," we should have come very near indeed to attaining even the ideal which we are now told is utterly Utopian. Before sitting down I should like to say one word, almost a personal one, as to the relief of Gibraltar. Major Walker says: "After all the fortifications did defend Gibraltar, the country wanted Gibraltar defended and it was defended." I maintain, on the contrary, that the fortifications did not defend Gibraltar, that if we had not been able to resume the command of the sea, fortifications or no fortifications, Gibraltar would have fallen in the spring of 1780, or in the summer of 1781, just as certainly as Minorca fell in 1782. It was to the enormous price which we paid for its relief by Darby in 1781 that I called attention. I am not for one moment saying that the country did not wish the place to be defended: quite the contrary, in the eyes of the country the defence was all-important; and it was and is justly proud of that defence. What I wished to emphasize was the enormous price which we paid for its relief. That price was the surrender of Cornwallis and the loss of our American Colonies. Putting sentiment on one side, I am not prepared to say that Gibraltar was worth the price. I do not think it was. I am not able to find in history any instance of Gibraltar having been of commensurate value to us; and I am quite sure that, if we were at war, and Gibraltar, in the hands of the Spaniards or the French, proved a thorn in our side, it would be no very difficult matter to take it from them, provided only that we had continued command of the sea.

Captain HUBERT GRENFELL, R.N.: In the few remarks I have to offer I do not wish to speak as a sailor, but as one of the public. I wish to note that if the papers which have been read, and if the discussions which have taken place mean anything, they mean this, that the highest experts in the Army and Navy of Great Britain are in sharp conflict upon the very foundation and essence of the question on which our existence as an Empire depends. It comes to this, that here in the greatest Empire in the world, as we like to call it, with a matériel and personnel whose excellence we are never tired of vaunting, we are still without what, for general purposes of explanation, may be called a "Plan of Campaign." Now, there are a great many Officers, I have no doubt, in this theatre, who are well familiar with a body called the German General Staff. I have some knowledge of it, and I would ask, what would be the answer which would proceed from the German General Staff if such papers and such discussions were mooted there as have been mooted here? I would ask whether the suggestion—and these papers and discussions are such a suggestion—that the principles on which the defence of the Empire rests are still unsettled and uncertain, would not be received with contempt and derision? Would they not say, "What on earth are we here for? Do you think that we are such bunglers at our trade that the very essence and foundation of our craft has not been thought out, and that we have absolutely no foundation upon which to proceed to build?" I do not wish to disparage our Intelligence Departments.

They have done most excellent work for the country, but I maintain that their work requires to be supplemented by some body analogous to the German General Staff. We need not, perhaps, go further than this theatre to find plenty of talent to deal with this question, but, at all events, I maintain that in the country there are adequate means of absolutely settling this question of how our Empire should be rendered secure, and if this is once determined, it would render such discussions as we have heard this afternoon, valuable as they are, absolutely unnecessary.

Captain GERARD NOEL, R.N. : I have read this paper with great interest (as I was not able to attend when it was read). I am very much impressed with the skill with which the battle with Admiral Colombe has been fought out, but I think in Admiral Colombe's answer he again gets the weather-gauge. I agree with the lecturer thus far, that naval ports and coaling stations should be defended by fortifications of sufficient power to enable them to cause considerable delay to an enemy who has temporarily overwhelmed the naval forces in the neighbouring waters, and that the mercantile ports should be sufficiently protected to warn off raiders. Major Walker's demands, I think, will be generally considered as moderate, but many naval Officers do not consider them sufficiently moderate. Now, I am of opinion that it would require a very limited amount of protection to warn off raiding cruisers, and that very moderate fortifications would afford considerable protection to our naval ports and coaling stations. For there can be no question of this, that it is a wrong policy for ships to submit to be mauled by forts; every shot that takes effect in an enemy's ship from a fort is so much clear gain to our Navy. Supposing, for argument's sake, that the enemy did, after a successful engagement, obtain command of the Channel temporarily, it could not be considered his policy to attack even a very moderately defended Portsmouth or Plymouth; he knows better, he must maintain his fleet intact in order to meet our refitted fleets when they are ready for sea again. Now, on the question of the command of the sea, which apparently is understood in such very different senses, I should like just to point out what may be considered a very good example of such a command. During the recent Russo-Turkish War in 1877-78, the Turks had a slightly more powerful fleet than the Russians, and what was the consequence? The Russians were locked into their ports in the Black Sea; they could make no use of the sea for moving troops or supplies, and the result of that was, as I do not doubt, the campaign was double the length, and more than double the cost, it would have been otherwise. If they could have carried their troops and stores from Sebastopol or Odessa along the coast, they would have brought the campaign to an end much sooner, and the reason they could not do so was simply because the Turks had a slightly superior naval force. In conclusion, I would just say a word on what one would conceive to be the duties of the two Services; the Navy holds that it is its primary duty to secure England from any approach of the enemy, and it expects every available person in the country to join forces in preventing an invasion, if such a dire event should seriously threaten. Of course, we look to the military to organize such a force, but as long as the Navy is on a proper footing the question of invasion is not to be entertained. The particular province of our sister Service, under these circumstances, is to join forces with us (that is with the Navy), and to carry the war into the enemy's country.

Sir JOHN COLOMB, M.P. : I did not intend, Sir, to offer any observations to this meeting on this discussion, had it not been for the observation of our friend Sir L. Nicholson, who raised the real issue involved, I think, in this discussion. He did so in the clearest possible words when he said that fortification was a substitution for what he called a third fleet—that fortifications were in substitution of naval sufficiency, because that is what it comes to. Now that is an assertion with which I must say I absolutely differ. I say, and I should challenge anybody to give proof that my view is not correct, that no fixed fortifications can take the place of mobile fleets. I was very glad Professor Laughton alluded to the misuse of a term describing the Navy as "a first line of defence." It strikes me that very term has led us into much of that confusion which we are to-day discussing. When we talk about a "first line of defence," I think we can only mean that it is a first line of defence against invasion. I can in no other way understand the adaptability of that term unless it be that it is the first line of defence against invasion. But, Sir,

I think that arises from not taking what is necessary in the question, an all-round view. You cannot say that the Navy is the first line of defence for the Empire, for this reason, that it is the only possible line of defence of the internal communications of the Empire. You cannot say that a Navy is the first line of defence for the protection of your commerce, because it is the first, second, third, and only line of defence for the protection of your commerce. Therefore it comes to my mind to this, that if you mean to preserve your Empire, as the internal communications of your Empire are sea communications, you cannot argue down the limits of your necessary naval force by bringing in fortifications at all. You have to provide for the sufficient protection of the internal roads of the Empire, and they are sea roads. Now even granting, which I cannot, for the sake of argument, that this country could survive the loss of her Empire, she could not survive the loss of her commerce. To say, "We will only think of the country, and not of the Empire, and we will whittle down our naval force to the extent necessary only to defend the country," leaves you still face to face with the fact that the commerce of the country is over the sea, and all over the world, and without that commerce the country cannot live. Hence you cannot whittle down the naval force necessary for the protection of your commerce. Then it comes to this: how is that force to be applied, and how is its extent and nature to be estimated? Well, it is estimated by the necessities involved, by the consideration of the ports of issue of an enemy, and the forces to issue at his disposal. You cannot protect your commerce unless you are prepared to play the part of a cat that does not run about the house looking for mice, but places itself down at the mice holes. In that sense I say the protection of the commerce of the country forces you to have a sufficient fleet to dominate the force of the enemy off its ports and in its own waters, and when you have done that—and now I come to the real point—would any territorial attack upon the country be possible? My gallant friend Sir L. Nicholson says, "Do not look at one or two Powers, look at three or four"—that is the question. The question is the possible combination, and you must be prepared, I say, to meet possible combinations, whether of one, two, three, or four. That being so, for the protection of your commerce you are bound, for the safety of the people of this kingdom you are compelled, by reason of their dependence upon trade, to have a sufficient fleet to keep the bulk of the enemy's fleet practically in its ports, or to ensure that you shall beat him when he comes out. It is from that point of view I approach this question, and it is only when you are assuming that position that you are entitled to consider fortifications at all. Therefore, when you are in a position to defend the roads of your Empire, when you are in a position navalily to do what is necessary for the protection of your commerce, you have destroyed the possibility of a combined naval force acting and co-operating in your own waters, and you have taken the first step for the security, not only of your Empire and your commerce, but of the shores of this kingdom. Therefore, I ask, "Are we justified in accepting the lecturer's views?" I say we are not, because the lecturer's views are founded on the supposition that fortifications can take the place of a fleet, as stated by our friend Sir Lothian Nicholson.

Sir L. NICHOLSON: No, no.

Sir J. COLOMB: Well, I am sorry indeed if I have misunderstood him, but I will ask him did he not say that fortifications were in substitution of what he called a third fleet?

Sir L. NICHOLSON: Yes.

Sir J. COLOMB: That is my point, but I do not accept his division of the Fleet into one, two, or three. My contention is that it is a whole fleet, a sufficient naval force.

Sir L. NICHOLSON: You must not take one part of my argument without taking the whole.

Sir J. COLOMB: I am very sorry that I misunderstood my gallant friend. I challenge him now to say, did he not, perhaps by accident, assert that the fortifications were in substitution of what he called a third fleet?

Sir L. NICHOLSON: Yes.

Sir J. COLOMB: The division of the fleet into one, two, or three parts is an arbitrary and artificial division, and it does not really affect the question. The question

is the sufficiency of naval forces for the definite purpose of protecting your commerce. That is my point of view, and a part of that force he designates as the third fleet. Therefore he accepts naval insufficiency, because he says fortification will take the place of the third fleet.

Sir L. NICHOLSON: No, no.

Sir J. COLOMB: I cannot understand the position from any other point of view. That being so, we must now come to the question of fortifications, and I say distinctly that I have always held that you must protect the stores and the depots of your fleet. That is what I maintained twenty-five years ago, and I stick to what I then thought, because time has certainly confirmed my opinion. You must have by local means protection for the stores and depots and supplies of your fleet. Therefore it comes to this, when you have provided for the protection of your commerce by dominating the naval power of the combination of your enemies in their waters, what then are the attacks that you may expect upon the supplies and stores of your own fleet? I say everything goes to show that the only attack that you would then have to fear would be the attack of raiders. That is what I have always maintained, and I do not understand my brother ever to have said that he would leave all the ports and stores and coals of the Navy absolutely without local protection from what may be reasonably anticipated as raiding attacks. Therefore we come to consider the extent to which the improvised cruisers, or possibly war frigates, may escape under the circumstances I have named. The next point is, is it likely that they will attack these places? All I ask is—and I think I may claim to have raised this question of local protection twenty-five years ago—reasonable protection by local means for our naval stores and coals all over the world against raiding attacks. What I complain of is this, that we should have extended that view until we have got to this horrible doctrine, that you can supplement naval power by fixing fortifications with militia or volunteers behind them. I have spoken rather warmly, because I feel so. I do exceedingly feel the gravity of our position as an Empire. I agree with my friend Colonel Brackenbury as to the differences arising on vital points between different naval and military authorities. I am quite sure the naval and military authorities have only one aim, and that is to get at the truth, and do the best for the nation. What I think has been the fact is that military and naval authorities have been led astray from a calm consideration of material facts by politicians and by popular influence based upon erroneous information. I am anxious to say also, that if the country will not provide money enough to discharge the naval and military obligations of this Empire, we have to consider the relative value of the different necessities of our defence, and that if we have only a certain sum to spend, and that sum is not sufficient to do all that naval and military men agree is necessary, you must sacrifice your fortifications, and even your army, to your fleet. I hope that will not be necessary. Before I sit down I would say another thing. Sir L. Nicholson said these garrisons and fortifications were to release the Army. Well, Sir, I cannot see, if you exaggerate the proportion of your fortifications at Portsmouth, Chatham, Plymouth, and Pembroke, and elsewhere, and at your mercantile ports, I cannot see how you are releasing the Army. I, Sir, look at the field of operations of the Army, not in this kingdom, but over sea, and on the frontiers of the Empire. When we remember that we have military or land frontiers abroad, which put together are equal in extent to the distance from this to Cape Horn, I feel it is time to think whether we are right in localizing the bulk of our military forces in its area of action to the United Kingdom only, as we have done. What I feel strongly is, that for the protection of the internal roads of your Empire, you must have a sufficient navy. India, every Colony, and every dependency under the Crown has a direct and common interest in the sea, and you can expect that the Colonies and possessions will act by and bye, as Australia has begun to do, and that they will help you to create and maintain this sufficient fleet. Therefore I decline to discuss a policy which has at the bottom of it the locking up of money and military force in an undue proportion, and an overdone system of fortifications for the protection of this country by purely military force from invasion. If we are going into the future with any confidence at all, we must go into it with a policy that, come what may, let nations develop their fleets as they may, the British Empire must do it also, or the British Empire dies; and having done that

we come to the next step, that is, a sufficient Army adapted for the defence of India and the Colonies abroad, and above all things adapted for counter-attack by descents under cover of our fleets on the shores of the enemy. Then you may face the future with confidence; but I protest against the doctrine that you are to go forth into the future with an insufficient fleet, and merely some newly arranged fortifications exaggerated in their proportions, and unnecessary in their extent for the protection of this country.

General Sir LINTORN SIMMONS, G.C.B., R.E.: The points which have been discussed in these various meetings seem to me to have brought the naval and military contentions to a much closer agreement than existed when the paper was first read. That paper I must say I misunderstood, in much the same sense as Colonel Brackenbury did, that it was intended, or at any rate if it was not intended, that it carried with it the contention that all military defences on our coasts, and for our naval and commercial ports, were unnecessary, and that their entire defence ought to be left to the Navy. The other day when I spoke here I said, and I repeat it, that if our Navy were so strong as to be able absolutely to guarantee what Sir John Colombe has rightly called the interior communications of the Empire, fortifications as a matter of theory might become unnecessary. But I asked the question, and have heard no answer, "What will be the extent of the Navy that would be required to afford absolute protection to those communications in all parts of the world?" I took the Report of Sir R. Vesey Hamilton, and the other members of the Committee who reported on the manoeuvres in detail; there were five requisites mentioned as necessary in order, according to their views, to place the Navy in a proper condition to oppose a great maritime Power. What were those five requisites? I believe that they would, if properly worked out under the supposition that we are opposed to two or three maritime Powers, increase the Navy to ten times what it is now proposed by the Government. (No, no.) Yes, I repeat it. Work the problem out in detail. We have the statement of these gentlemen that for a blockading fleet you require five ships in the blockading squadron to three ships that are blockaded. You then require an effective reserve squadron, absolutely confined to home waters, sufficient to hold the Channel and protect the coast and commerce of the United Kingdom. Then, in addition, they say you require ironclad ships for active local defence on the coasts for the protection of Great Britain, Ireland, and the Channel Islands. (No, no.) All I can say is, there is the Report, which you can read. I have not got it with me now, but I had it at the previous meeting, and quoted it *verbatim*. Altogether they have demanded a very large order, such an order that I believe that the country would not dream of it for a moment, and I doubt very much whether you would find sailors sufficient to man the fleets if they existed, and to carry on the commerce of the country at the same time. I hear naval Officers assume that they have the command of the sea. I do not believe our British Navy at the present time is in a position to warrant that assumption: I believe it is not in a position to enable us to take that as an axiom, and it certainly is not likely to be so before the year 1894, when the Admiralty programme, which is a very great step in advance, has been completed. I believe that programme is a mere instalment of what we require, and that before we can assume as an axiom that the British Navy commands the sea, not only in our home waters round these islands, but in the Chinese seas, in the Australian seas, in the Mediterranean, and elsewhere, the naval defence will be a very expensive operation. That being the case, I think what these gentlemen are all agreed to is self-evident, that the "stores and other things" must be protected by other means, and that the real question under discussion is as to the amount of protection to be afforded in each case. We are agreed on that point now: the question then is what is to be the nature of that defence. Now I can state most positively, having been on Lord Carnarvon's Commission, and having been employed in various ways in connection with fortifications, that the fortifications that have been constructed for many years are not excessive. The amount laid out on actual fortifications in the Annual Estimates is only a few thousands, 10,000*l.* or 20,000*l.* at the very outside, and that has been the case for the last fifteen or twenty years. There was a loan of 3,000,000*l.* the other day, but that was not so much a question of fortifications, as it was due to the improvement in matériel, which rendered necessary the changes in the armaments, and the

re-arming of the fortresses. But there is a fallacy which, I think, underlies a good deal of what has been urged. It was referred to by a previous speaker, and it is also referred to by Admiral Colomb, who says: "Are we sure that it is not mistaken ideas on the question of defence which produce the anomaly of the greatest Navy in the world costing only 14,000,000*l.* a year, while a numerically small Army costs 20,000,000*l.*?" The question so stated has nothing to do with the defence of England. A great portion of the Army that costs 20,000,000*l.* is connected with the defence of our land frontiers in India and elsewhere, except that India pays for the Army actually in India; but it does not pay for the Army in England, which is the dépôt in great measure for the large force in India. The same thing applies to the defence of the frontiers of the Cape of Good Hope: a large force is almost constantly required there, or there must always be a military force ready to be sent there. These are all included in that estimate of 20,000,000*l.*, so that it is a comparatively small portion of that 20,000,000*l.* which should be taken into account in considering this question of the defence of our maritime ports. Then we hear what the duty of the Army is: it is said one great duty is to go abroad and fight on the Continent. For my part I believe the day is gone, at any rate until the great armies of the Continent are reduced, when the small active Army of Great Britain available for such an enterprise, which at the outside will amount to 50,000 men, will be of any great effect in Continental wars, unless under one contingency, namely, when the military Powers have exhausted themselves in the contest; then such a small contingent as that which England may send on the Continent might be of some importance in determining the war. But as to the idea of sending troops abroad and launching them on a great expedition on the Continent, I think it is out of the question. What we can do is this: when the defence of our ports is of importance, and the defence of some of them is undoubtedly of the greatest importance, should an enemy's squadrons or raiders attempt to attack them; say, for instance, London. If London were totally devoid of fortifications; if the Thames were open, there would be nothing to prevent ships coming up and destroying an enormous amount of property now in comparative security behind the defences which exist in front of Gravesend; whereas these defences would prevent such a disaster. They are also of the greatest importance from another point of view, that is, if they exist they will most probably not be attacked. It is no argument against permanent defences to say, as has been urged in these discussions, that the fortifications of Plymouth or Portsmouth have never fired a gun in anger, but the fact of their being there has prevented them from being attacked. I am not an advocate, nor do I think any military man is an advocate, for excessive fortifications; on the contrary, we desire to minimize them to the utmost, consistent with what may be the probable attack that may be made against them. I was very much struck by what Captain Grenfell said, and I quite agree with him that this discussion is very difficult to carry on here, because there are numerous points in the consideration of these questions which cannot be divulged in public. We are therefore in a very imperfect position for the discussion of these great questions in this theatre. It would be as absurd for the Government, or for authorized people in this country, to expose our weak points, or to develop the measures necessary for the defence of the Empire, as it would be for the German Staff to exhibit all their plans of offence and defence across their various frontiers. For this reason I think the discussion, although it has produced good, cannot come to any final conclusion. I only regret, and what has been said by one speaker has supported my view, that we have two departments, and that there can be any possibility of division of opinion between the two Departments. I think, as I said before, we ought to have a great Department of War, which should consider the whole question, with subordinate Departments of the Army and the Navy working under one responsible head. And I am further tempted to say, that if there were a calamity or disaster to this country there is no single person that could be held to be in the least degree responsible for it. The Government of the day may be turned out, but that will not afford a remedy. We have changeable Governments: there is no one responsible, and it is an utter myth for the country to suppose that anyone, even a Secretary of State for War, or a First Lord of the Admiralty, is responsible for the defence of the Empire. I think the only way to settle the question is to have one

great Department of War, as they have in Germany. There the head of the Department is the Emperor, who brings together all the various opinions of the different Services. I think we ought to have a similar Department under a responsible Minister for War, assisted by persons of experience, who would not be subject to frequent change, and would be responsible before the country for any advice they might give, and if things were to go wrong through their neglect, they ought to be hanged.

Major WALKER: I should like to make my observations very short, but the advantage which Admiral Colomb has had of answering at very great length in print the observations which I made the other day will necessitate my taking up a few points, though I will endeavour to make my remarks as short as possible. The reason that I am obliged to make some reply is that Admiral Colomb has made charges against me which directly call for an answer. He has given one or two instances to prove that I made "wild shots" in some of the illustrations I have given, and he implies that I have not thought at all about what I was saying as to the real bearing of these points upon the question under discussion. Well, Sir, that is not the case: if Admiral Colomb will excuse my saying so, I did not make wild shots: I may be wrong, but I thought and still think that the instances I brought forward bear out my statement as far as it goes. I think that where Admiral Colomb has misunderstood me is that he has thought that I carried my argument a great deal further than I intended to do. Of course my argument will not bear out the statement which I assume Admiral Colomb supposes I intended to make, that a flanking fleet is of no use whatever. I began my lecture by saying that I admitted that the principles of strategy are eternal. They are just as applicable to a naval force as to a military one, and for anybody, soldier or sailor, to say that a flanking fleet has no effect would be an absurdity. What I wanted to say was that it was not an absolute bar to any action in every, even the most extreme case. Admiral Colomb, I thought (I may be wrong), in his lecture asserted that the flanking fleet, no matter how small or how distant, was an absolute bar: and he quoted the case of the Baltic as a proof of that. With this explanation I will proceed to answer a few points in Admiral Colomb's reply, and first as to the money. He objects to my saying that the average Englishman does not like fortifications. He says, "the average Englishman voted 11,000,000/- for fortification in 1860, and 3,000,000/- in 1887." The average Englishman no doubt anticipated an expenditure of 11,000,000/- in 1860, but there was not any such expenditure; there was an expenditure of less than 7½ millions. Again, the 3,000,000/- now voted is not 3,000,000/-, but only 2,600,000/-, and of that a very considerable portion is not for fortification proper, so that you must make a considerable deduction from Admiral Colomb's 14,000,000/- There is another point which, I think, is still stronger, and that is, what are these millions for? To say that from 1860 to 1880 we spent 7½ millions on fortifications is an absurdity; why was it necessary to spend 7½ millions in 1860? Because the fortifications of the country had been neglected since 1815, so that the 14,000,000/-, with the deductions I have mentioned, is the expenditure on fortifications for seventy-five years. Now we come to the small point about the twelve guns in cupolas. The fact is, if it is a mistake it is a "Times" mistake, which I do not think is worth noticing. Again I say "naval history says no." Admiral Colomb twists me with having confused battle-ships and cruisers, and he apparently thought that I imagined an attack by cruisers while he said battle-ships. I may have fallen into the error, but surely the less is contained in the greater, and I assume if you could have five battle-ships off Plymouth, you could have a few cruisers, and more than that, if you have five battle-ships, I have always understood that a fleet of battle-ships would be accompanied by cruisers. I believe that is the proper formation of a fleet, to have vessels of all sorts combined, and if there were five battle-ships they would have a proportion of cruisers with them. However the question is hardly worth disputing about. Then he asked me very pointedly what Plymouth was fortified against. I think I ought to say that I was discussing Plymouth as unfortified. I was talking of Admiral Colomb's assumed Plymouth where he said: "Supposing there had been no fortifications at Plymouth there still would have been no danger of attack at all." But as a matter of fact Plymouth is fortified against a powerful attack, not only an attack

by cruisers ; and with reference to this Admiral Colomb may say, not to me but to the authorities, "That is your military ignorance in having fortified Plymouth against attack by a fleet which is impossible." But is that the general opinion of the Navy ? It may be wrong. But there is a remarkable case to indicate at all events a divergence of naval opinion on the point. A very short time ago at Shoeburyness, before the School of Gunnery, a naval Officer, Captain Meryon, who of course we presume is an authority on naval affairs, lectured on this very subject. The lecture was based altogether upon the assumption that Plymouth was easily attackable by an ironclad squadron. Captain Meryon assumes that attacks on Plymouth, on Malta, and on Portsmouth were all possible, all easy, would all be carried out in a few hours ; there was no question of delay, no question of special ships.

Captain CUSTANCE : Might I explain, as I have talked with Captain Meryon on the subject, that it was part of his brief, he could not have lectured unless he had supposed that the place was open to attack ; it was part of his brief.

Major WALKER : I went down very shortly afterwards to Shoeburyness to lecture upon the subject of fortification. I assumed some facts, I said this, that, and the other about ships. I do not know whether what I said was right, but I assumed that an attack on a place like Portsmouth was not an easy thing for a fleet. Then they said to me, "Why there was a naval Officer down here the other day, and he told us how the thing is to be done. In Heaven's name how are we to get at the truth ?" I do not know exactly what the Navy want in the way of forts, now, even after hearing Admiral Colomb. Then there is the remarkable case of Ascension. The Island of Ascension belongs to the Admiralty, and what have they done there ? They have fortified it and mounted guns upon the island, and are now, I hear, particularly anxious to get modern guns for this station. Why this anxiety to retain and rehabilitate a station condemned by Lord Carnarvon's Commission if the Navy want no land defences ? The next point is the one about the Baltic, and this is very curious, because Admiral Colomb in fact says that I am utterly wrong, not having had the advantage of seeing the French authority from which he took his information, a pamphlet by M. Pont-Jest. My account of the Baltic campaign was taken from the only source I had at my command, the German official account. That I believe is perfectly accurate, and I am confirmed in that by this book which Admiral Colomb has now very kindly put into my hand, and which is the source upon which he depends for his argument. It is a description of the campaign given by a gentleman. I do not know who he is, but he says he was officially attached to the Admiral, so that I suppose he was an official of some kind, but he is not apparently a naval Officer. But what is it ? It consists of eight articles extracted from a French provincial paper, being a defence of the Admiral.

Admiral COLOMB : Not a provincial paper, but the seat of Government was then at Tours ; the *Moniteur* was published there.

Major WALKER : It is an extract from the *Moniteur* containing a defence of the Admiral against accusations which had been made against him, of having done nothing in the Baltic. When we come to the defence of an Officer for not having done something that he said he could not do, and that people thought he ought to have done in a campaign, written by a man under his orders, I think we might make some allowances for lapses from judicial accuracy, but I do not propose to make any. I accept the statements here, and what do they amount to ? From my point of view I think not at all to what Admiral Colomb wants. Admiral Colomb says, describing Count Bouët's having obtained information on the 13th August that the blockade was raised and the fleet at Wilhelmshaven was coming to the Baltic, Bouët ordered the fleet to reassemble at the Great Belt to meet them, and that it is conclusive of the power of the flanking fleet. Bouët had six or seven ships. There were at Wilhelmshaven three frigates. I believe there was another German ship at Kiel, a wooden frigate, and these ships were coming round, so Admiral Bouët orders his fleet to go and meet them at the Great Belt. What else could he have done ? (Admiral Colomb : Hear, hear.) Here are three ships. (Admiral Colomb : It is a fine point.) Oh ! no, it is not, if you will only hear me. Here are six ships with the opportunity of eating up three ships,

and they take the opportunity. The Germans did not come round, unfortunately, and Bouet did not eat them up. What does he do? When this opportunity is removed he goes right on to Colberg and prepares to bombard, but he does not do it. Why, because of the flanking fleet? No, but because, he says, upon the piers and wharves there was a crowd of women, children, bathers, old men and sick people, and he will not bombard them. Why? Because he wants to give M. de Bismarck a lesson in humanity and true courage. He gave him that lesson, but mark the sequel. A very few days afterwards he was joined by a ship called the "Rochambeau," which had a lighter draft of water than any of the ships he had on the first occasion, and it was able to get nearer up to bombard Colberg. He went back with the "Rochambeau" to bombard Colberg, and he lets out very innocently what he thought. This gentleman says in the pamphlet, if he had had the "Rochambeau" on the first occasion, it would have gone very hard with him if he had not had a shot—if he had not made what he called a "serious demonstration" against Colberg. Surely all this does not prove anything except that this Admiral, having had the opportunity to destroy a very inferior fleet, lost it, which does not prove, with regard to the three ships at Wilhelmshaven, that, if he had known they were staying there, he would have taken the slightest notice of them. The ships were blockaded the whole time to the end of September, and he had the command of the Baltic, and he did nothing, and he tells us why he did nothing. He says he suffered from conflicting orders, from shallowness of water, and a lot of other causes, but he never once utters a syllable about the flanking fleet.

Admiral COLOMB: Would you mind quoting the last paragraph which is quoted in the print.

Major WALKER: "La machine tint bon, heureusement, et le 'Rochambeau' parvint à rallier l'escadre, quise dirigea sous Kiogo-Baie. Colberg, une fois de plus, a été sauvé, car à peine au mouillage, le Vice-Amiral Bouët fut informé que l'escadre du nord était entrée à Cherbourg, que la Jade était débloquée, et très-probablement la flotte Prussienne en profiterait pour pénétrer dans la Baltique, afin de l'y surprendre."¹ Now, I take the case of the Mediterranean. That is also rather curious. Admiral Colomb again made some assertions that were very strong as to my ignorance of the subject and the fact that Napoleon knew nothing at all about the possibility of interruption. Now, on that point, there are some curious details that I have noticed. Napoleon arrived at Toulon on the 8th May. The same day Nelson entered the Mediterranean at Gibraltar, and Admiral Colomb is correct when he says, before Nelson entered the Mediterranean there were no British ships there. But Napoleon was fully impressed so early as the 8th May with the necessity for haste. "He knew from the movements of the English that he had no time to lose."² Again, on the 19th, the day the French sailed from Toulon, Nelson was actually cruising very near Toulon. On that night his fleet was dispersed by a storm. The French fleet got to sea without Nelson having been aware of it, and the French proceeded to Malta, where they did not arrive till the 10th June, but as late as the 2nd June Nelson knew that the whole of the French transports had not sailed from Genoa, so that he not only knew that they had escaped, but also in a general way where they were, in fact he expected to meet them at Naples or Sicily. On the 7th June Nelson was joined by a reinforcement of ten ships of the line, which brought him up to an equality with the French fleet in line-of-battle ships. He sailed after the French and the result we all know. But there are a few other points that I would like to mention with regard to the knowledge of the French of the danger they ran. In the first place Lord St. Vincent was blockading Cadiz and had been there for months, and that was quite enough on the extreme theory of the flanking fleet. Lord St. Vincent had eighteen sail of the line at Cadiz, and on the extreme theory of the flanking fleet Napoleon ought not to have been able to stir out of Toulon even supposing that Nelson had never come into the Mediterranean. I am carrying it to the extreme point that I think Admiral Colomb did, and therefore I say that I was perfectly right in asserting as I did that Napoleon did risk it; he did know. He says himself distinctly in his memoirs that

¹ I read this in English.

² Bourrienne's "Life of Napoleon."

"the supposition of an engagement with the English was the general subject of conversation," *i.e.*, on board the French Fleet. And Bourrienne says with regard to the capture of Malta, how fortunate they (the French) were to obtain possession of this strong fortress, to have it handed over in two days to a fleet that "*was pursued by an enemy.*" Surely if anything is plain it is perfectly certain that they knew this danger. Indeed the French Admiral said, "God send we do not meet Nelson." Napoleon himself was so sure that they would have met the English fleet that he trained the soldiers to board an enemy's vessel. He had so strongly anticipated a contest with the English that he actually drilled the men in anticipation of it, so that I think there again I am justified in saying that Napoleon wilfully ran the risk. But now what do I mean by the whole thing? I felt bound to make this statement because Admiral Colomb accused me of making wild shots. On the contrary, I took a considerable amount of trouble. I have known the history of the expedition of Napoleon to Egypt since I was a child. What I am contending for is not that a flanking fleet is of no use, but that Admiral Colomb strained it too far; and all I say is this, that the flanking fleet must be sufficiently powerful, and must be within striking distance. And what does that striking distance mean? It is not a fixed distance; it is not 700 miles, 300 miles, or any other fixed distance, but it depends entirely on the genius, or the boldness, or otherwise, whichever way you like to call it, of the commander, and to some extent on the resisting power of the fortress. Napoleon risked it and he would have risked it over and over again; he risked it in Egypt; and what afterwards happened to him and his army does not affect the question in the least. Then there is the case of the Baltic. Admiral Colomb and Professor Laughton accused me of not knowing that the Russian ships were sailing ships, and that a portion of the allied fleet were steamers. I knew that perfectly well. Admiral Colomb says I did not casually read Earp's "Campaign in the Baltic." That was the very book I did read. I took the numbers of the combined fleet off Cronstadt, and neglected the detached squadron which made nine more ships under Admiral Corry (?), but that does not affect the point. Admiral Colomb proves my case for me, because he says that Sir Charles Napier was very much concerned about the safety of his flank. That is to say he was concerned about this Russian fleet, which (says Admiral Colomb) could not by any chance have issued out of Cronstadt; he was alarmed—I use the word in a Pickwickian sense—and still he went and attacked Bomarsund. What I say is this: if Admiral Napier, who was not perhaps a genius of the highest order, although a very distinguished Admiral, ran any risk that he thought was a risk, what would Napoleon have done under like circumstances? It all depends upon the man. Napoleon would have run the same risk if the flanking fleet had been within a quarter of the distance, and you may always have the same thing. You must remember, "Some new Napoleon may arise to fright the whole world again." I would like to see him, I think we want it. There is one very curious point. I will allude to it, because so much has been said to-day about the necessity for only light fortifications, and the difficulty of determining what the fortifications should be. Admiral Colomb says, "it is certain that it would take a great deal of fortification to stop a light attack," and he proves it by a very remarkable instance of the war in the Baltic, and it is absolutely true. But his whole argument is that I am putting too much value on fortifications, and here he is putting the very words into my mouth—here is the very proof that I want, that it takes a good deal of fortification to stop *even a light attack*. I quite agree that it does take a *good deal*, and it is merely a question of how much. Then, again, Admiral Colomb says that I did not know that Admiral Baird raised the blockade of Berehaven because some ships had escaped, and he feared, not an attack on his base, Milford Haven, but a superior force attacking Admiral Rowley's fleet; why did he not fear an attack on Milford Haven? Because it was fortified.

Admiral COLOMB: I shall not tell you why, but he did not.

Major WALKER: I should have begun by disclaiming any official sanction for my paper. I should add, that every opinion expressed in this paper is my own opinion, exclusively my own, and nobody else has anything whatever to do with it. There is next a question of refitting and revictualling about Kioge Bay. I think this witness of Admiral Colomb's, M. Pont-Jest, tells rather against him. He says,

Admiral Bouët-Willaumez in the Baltic had his open base at Kioge Bay. And what does Admiral Bouët's apologist say, but that it was one of his great misfortunes, because he had constant trouble from it, that every time any ship had to revictual, he had to keep another ship on guard to prevent her being attacked; and another French Admiral actually left the North Sea and returned to Cherbourg, because he said he could not get any provisions or coals, because he had not a proper port to go to? In the second campaign in the North Sea the French had actually two squadrons blockading Wilhelmshaven, which returned alternately to Dunkirk to revictual. Admiral Colomb asked me where I got the illustration of the maritime frontier from. I am very sorry I cannot quote the passage, but I am almost sure it was in one of Brialmont's works. I read it when I was in Canada, and it made rather an impression upon my memory, but I cannot recall the exact reference. I have noted very briefly some of the things that have been said during the discussion to-day. It is quite impossible for me to go into the whole story. With Admiral Sir Vesey Hamilton nobody could disagree. What he said was absolutely true, and I for one am certainly not concerned to deny anything he said. He asked some question as to whether I expected forts to do the duties of ships. The answer is, of course I do not. I said in my paper the comparison between forts and ships ought never to have been made; they are different things. He goes into my quotations about the attack on Egypt and Malta, and all that, but as he is not here, there is no use, I think, in answering him. I have already answered it in my reply to Admiral Colomb. Admiral Sir Edward Fanshawe made some remarks which I think I ought to answer. He spoke about my having proposed to have defence against a landing, but why did I do so? Why did I talk about a landing? Because if you reduce entirely the land force, then a landing becomes possible. If you are prepared, I do not think it is very probable. If you are not prepared, I think it is very possible and probable, and my reason for mentioning the subject is, because it was laid down a short time ago by Captain Penrose Fitzgerald, that he would disarm the volunteers. If the volunteers were disarmed, and we had no army in this country to resist an attack, the temptation would be so great, that some Napoleon would most undoubtedly try it. What did Sir William Harcourt say last night, a statesman of first class ministerial rank? He says: This craze for voting money for the fleet is all nonsense; it is a craze manufactured by the experts, and he adds, this is the point of it, I wish that the immunities which we enjoy in this country from invasion on account of the Channel—not of the Fleet, the Channel; it is the Channel, as I have said in the beginning of my lecture; hundreds of thousands of Englishmen are under the impression that it is the Channel that saves them, not the Fleet—he says, speaking of the immunity this extent of water gives us, I wish it would at the same time prevent us from attempting to go and attack our neighbours on the Continent. It shows the superstition there is, as I have said. Professor Laughton, I think, is the one exception to the icy atmosphere which has encompassed us. Professor Laughton appears to me to have got very hot over a subject that I think it very little worth contending for. Admiral Colomb has passed it by—my point, i.e., about the relief of Gibraltar, as, I suppose, either unimportant or unanswerable. But Professor Laughton again to-day re-asserted very strongly all the old story about the fortifications of Gibraltar having caused us the loss of our American Colonies. What does it matter whether they did or not. What has that to do with the point we are discussing? The point we are discussing is whether fortification is a useful subsidiary to fleets, and in that particular case it was. It enabled Gibraltar to hold out in the intervals of the periods at which it was relieved by our fleet, and if it caused the loss of fifty Colonies, this has not the slightest bearing upon the question we are discussing. Professor Laughton brought forward another point very amusing, and it is so good I must ask your patience for a short time. It was with reference to the Commission of 1785, and Professor Laughton has correctly quoted all that was said and done by the land and sea Officers, but he has not told you anything about the debates in Parliament. Admiral Colomb sprung this large subject on me very suddenly, but I did get hold of some very curious speeches, from which I will read some extracts to you, as showing the real reason why that Bill was rejected. The proposal was for improving the permanent fortifications of Portsmouth and Plymouth, to enable the fleet to act with effect

abroad. The land and sea Officers reported unanimously that neither land nor sea forces are sufficient without fortification, and the first datum in the reference to the Board of Officers, to which the Board *unanimously agreed*, actually asserts the necessity for fortification of Portsmouth and Plymouth, by assuming "the temporary absence of the fleet, or its inability, from other causes, to defend the dock-yards." And Mr. Pitt asks, it having been asserted by somebody that the Board had been led by the nose by the Duke of Richmond, "Was it credible that a Board consisting of such men could have been duped into giving such a report?" The Officers who dissented did so on the ground, not that the fortresses were not required, but that there were no men to man them. Is not that very strange? "The land and sea Officers in the report agreed in adding gunboats as a defence in every case." There you see you have the Army completely agreeing with the Navy on the floating defence. There is no difference of opinion. Lastly they say: "Your Majesty's land and sea Officers humbly observe that they make this report in the full confidence that providing additional security to the dockyards is in no respect inconsistent with the necessary support of the Navy, which they consider as the first object of attention for the safety and prosperity of the kingdom." Is there the slightest difference between the opinion of the land and sea Officers in 1786 and the views put forward in my paper? You cannot show the slightest difference. Mr. Pitt said, in introducing the measure in the Commons, "*The system of fortification did always make part of the general defence of England*, and he would prove it by the most incontestable records of history," and he quoted in proof specific instances in every reign from Henry VIII to Anne. A gentleman named Bastard got up and said: "These strongholds will be seminaries for soldiers, universities for pretorian bands." Mr. Lemon said: "A system which might grow into a formidable engine of prerogatives." You see the point. It is nothing about the Navy; it is all (the old nonsense cropping up again) the fear of a standing army. Lord Hood, of whom Nelson said, "he was the best Officer, take him altogether, that England had to boast of," and again, "that he was equally great in all circumstances in which an Admiral could be placed." Lord Hood strongly encouraged the proposal, and voted for it on the ground that it *would give freedom to the Navy*. But the great speech against the measure, the speech which carried Parliament against it, was made by whom? A great naval authority? No, by Sheridan, whom we all know only too well. And what was his argument? He said, this measure "strikes at the root of the Constitution itself." And, alluding to the proposed militia garrison, he says: "Would it even for a moment be pretended that men under such disciplined habits were not a thousand times more likely to despise the breath of Parliament, and to lend themselves to active purposes of tyranny and ambition, than the loose and unconnected bodies, which exist, even with jealousy, under the present regulations?" And again, it "must insure an unconditional submission to the most extravagant claims which despotism could dictate." That is to say, the whole argument against the extension of the fortification of Plymouth and Portsmouth was directed not against fortifications, but against the raising and maintaining of a military force for their defence. The House divided, and the resolution was rejected by the casting vote of the Speaker. If I had more time, and the meeting had not thinned out so much, I could have given many more proofs that the view I take is a reasonable one. But what is the view I take? I think it has been misapprehended. I do not propose for one moment to say that a powerful fleet is not our first necessity. I accept fully all that Sir Vesey Hamilton said; but I do think it is a pity that we should have brought this discussion at all into this arena. What do the papers say? The papers have taken the subject up very warmly, and I have seen a very large number of extracts from the journals, and they have said every absurdity that it is possible to utter on the subject, from the "Times," which has gravely misrepresented my paper, down to a journal which writes, "Major Walker thinks that fleets are all nonsense." It is into the arena of a discussion conducted on these principles, mind you, that we bring down the question by discussing it here, and it is into this arena that we bring the discussion as to whether there is any difference of opinion, or any discrepancy between the Army and Navy. I, for one, think it is a mistake. I think, under the peculiar circumstances, I was bound to make some

answer to Admiral Colomb, but I regret excessively having been obliged to do so. I regret excessively that Admiral Colomb obliged me to do it.

Admiral COLOMB: That is what I wanted.

Major WALKER: That is so; but I think it is a mistake, because you cannot convince people who are absolutely ignorant. What is the position the "Times" took? The "Times" must surely know that there is not a gun mounted in any fortress of the Empire that is not done by the authority of a Board which embodies all the highest Officers of the Army and Navy; then what is the use of saying the Navy are not consulted, and money that ought to go to the Navy is squandered upon forts? Everybody is consulted, and although I may agree, and do to a very large extent, with Admiral Colomb, still I say that neither Admiral Colomb nor I can change the whole administration of the Navy simply because we happen to disagree, if we do disagree, with what is done by the higher authorities. It is done by authority, and by the authority of the highest Officers of the Army and Navy.

Admiral COLOMB: Without any central control.

Major WALKER: I fully agree with what Sir Lintorn Simmons said about the control, but we cannot help it. The "Times" goes full charge at the War Office; but it is not the War Office; it is the Army and Navy together who are responsible for things as they are, or is it not rather the system by which both Army and Navy are controlled?

Admiral Sir HOUSTON STEWART: I think we owe a debt of gratitude to Major Walker for one sentence. I am now sorry that I have not taken part in this discussion. It is this: "A satisfactory defence of the Empire can only be obtained by a just combination of all the elements of defensive strength, ships, fleets, material obstacles, organization of men;" and it ought to be put up in golden letters over our spending departments, and in the House of Commons; gold is the colour that stands best the damp and foggy climate of London. I for one tender my best thanks to Major Walker for embodying in his lecture a truth which is the whole point, and, to my mind, unassailable.

Major WALKER: One more word: Lord Wolseley has asked me to point out, in his unavoidable absence, with reference to the question he raised here regarding the invasion by William III in 1688, that there are very strong proofs, amounting in fact to certainty, of Dartmouth's fidelity to James II, and of the full intentions of the fleet to fight the Dutch if they encountered them. That the fleets did not meet was due, as we all know, to the "Protestant wind," as it was called, which, while favouring William's movements, kept Dartmouth wind-bound in the Gunfleet till too late. I cannot at this late hour detail all the movements of the fleets, it will be sufficient to quote James II's own letter to Dartmouth, written on the 9th November, 1688, in which he says, "Nobody could work otherwise than as you did; I am sure all knowing seamen must be of the same mind." And James was himself no mean authority on such a point. And Dartmouth, speaking to Burnet after the event, says, "that whatever stories the Dutch might have heard of Officers or seamen, he was confident they would have fought very heartily."

The CHAIRMAN: Bearing in mind all you have heard, and looking at the clock, I shall confine any remark I have to make within the smallest possible limit. As far as my memory serves me, Admiral Colomb, either in the paper which he read on the 1st March, or in the remarks with which he prefaced it, said that his great object was to raise discussion, and if so, I think we may congratulate him on the realization of his intention, for we certainly had not one discussion, but four discussions, and those really of a very exhaustive character. Now just one word as to what is the result of all that has been said upon the recent occasion in this theatre. I think we may safely say that we are all of one opinion as regards principles; but that with regard to details there has been a difference of opinion. We hold, I think, both soldiers and sailors, that the supremacy of the Empire on the sea must be maintained at any cost, and even at the sacrifice of any existing interests. Then I think we all agree that there must be fortifications for the protection of our maritime arsenals, and also for the coaling stations. With regard to the extent of these fortifications there is a very great diversity of opinion. Some hold that it is merely necessary that they should be of such a character as to beat

off raiding armed cruisers: others think that this is not sufficient, and that the fortifications should be able to make resistance to a much more formidable attack. I confess I think the latter view is the safer, but that is a very different thing from affirming that fortifications can be a substitute in any way for the naval forces of the country. To hold such a view as that would be a great mistake, and in order to avoid that mistake it has been well said, more than once, during the discussion, that we should not term our maritime fortresses a second line of defence, because that implies that they are of greater importance than they really are. I conceive that they should be looked upon as protected bases of our naval operations. That view, I think, stamps our fortifications as to their utility, and I am quite sure that if the thought should ever arise of doing away with them, the men who would be the very first to protest against such a measure would be the Officers of the Royal Navy. I repeat that we are all of one mind, that the supremacy of the country at sea is the main thing to look to, and we must take care to insure that Britannia, whether she "needs bulwarks or does not need them," is able to rule the waves. I have nothing more to do than to propose a vote of thanks on the part of the meeting to Major Walker for his very able paper.

garrison on which a portion of the force of the Royal Horse Artillery has been sent to India, and on which a number of other different and less serious difficulties have been experienced. The Royal Horse Artillery has been sent to the Indian Army, and the Royal Artillery has been sent to the British Army.

Friday, May 3, 1889.

LIEUTENANT-GENERAL C. C. FRASER, V.C., C.B., M.P., in the Chair.

HORSE ARTILLERY.—LECTURE 2.

By Captain W. J. ROBERTSON, R.H.A.

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PART 2.—Secondary use of Horse Artillery.

PART 3.—Strength in British Army. Expense.

IT was my privilege on the 4th May last year to give in this theatre a lecture on "Horse Artillery,"¹ a step that caused me many hours of anxious foreboding and thought, much friendly counsel to abstain, and very many hours of pleasant research. I undertook my self-imposed task because I was thoroughly imbued with the idea that, of all parts of the Service, the Royal Horse Artillery stands most in need of augmentation.

Let me commence by saying that not for one moment will I allow that I am at all forgetful of the great use of the artillery itself, but I find friends of the arm standing up and defending it, in every direction; with the horse artillery in the British Army it is different, and the allusions made to it in papers on artillery are usually summed up in a few sentences. In my last lecture I thought it wise to confine my remarks largely to the past. I gave a short historical account of how the arm had been created and used in the olden days. Then I gave further examples of its primary use with a cavalry Division, its secondary use with the Corps Artillery, principally taken from the war of 1870, and in the last part, treated of the impossibility of any other arm performing its rôle.

The lecture met with little hostile criticism; several cavalry soldiers spoke strongly of the absolute need of horse artillery in the various phases I had indicated, and all present deplored that we possessed so little of it. The only real criticism I met with proceeded from an attack on the veracity of one of my tables, viz., the strength of horse artillery in various armies—a point that I will allude to later.

I come before you again this year from believing the fact, that as an

¹ See Journal, vol. xxxii, page 609, *et seq.*

army, I do not think we believe, in horse artillery. I fear no contradiction in saying that the British Army places a lower value on the effect produced by artillery fire than either the German, French, or Russian; and if this be true of artillery fire in general, it is still more true of horse artillery fire in particular. And the reason for this state of affairs is easy to seek. The British soldier, unlike his European *confrère*, has never stood under a heavy artillery fire from modern guns. A glance at our foes in the last twenty years, numerous as they have been, will at once prove this. Maories, Zulus, Affghans, Boers, Egyptians, Soudanese, all have been deficient in a properly trained and mobile artillery. But if we ask the French for instance, we find Napoleon III excusing himself at Sedan not on account of the Prussian numbers but on account of the fire of the German artillery. If we ask the Germans, we have the greatest master of artillery commencing his famous letters with the sentence, " You quietly, my dear friend, put to me a very grave question, when you ask me—' What is the reason that our artillery, which in the campaign of 1870-71 did such excellent service, failed altogether four years before ? ' " And if we ask the Russians, we have that truly remarkable man, General Skobeleff, when sent to Central Asia, insisting that he should have plenty of artillery. But if this be at any rate with us admitted by a few outside the Royal Regiment of Artillery, hardly any remember that it applies equally to the fire of guns when cavalry are acting independently.

The honest fact is, that in peace-maneuvres horse artillery is simply in the way. A necessary evil perhaps, but an evil still, it may hamper the cavalry Division or brigade, it certainly cannot hasten its progress. It may be the cause of blame, it cannot be a matter of praise; hence, as a rule, when employed in this way, we horse artillery exist simply on the sufferance and goodwill of the principal arm, and on the customary traditions of the past.

Looked at in the light of military history, the next war between two Great Powers will have consequences perhaps greater than any that have gone before; this will be due more to the great and rapid changes in material than to the years that have passed since the last conflicts. 1870 was thus nearer to the wars preceding it than 1870 and 1878 are to 1889.

In the present age of patents and discoveries war becomes far more a problematical game than at any period of the world's history.

Among the many theories waiting to be proved and tested by rough experience are two specially bearing on the subject of horse artillery, namely, the cavalry screen and the use of shrapnel; and let no one say that it is useless speculating on such subjects, victory will rest with that Power that has adapted its forces and trained them for the work to be performed in the coming fight.

The War of 1870 taught four great lessons:—

1. The power a well-defined mobilization of a nation's forces on war strength gives in the initial phases of the struggle.
2. The impossibility of troops moving in close columns to withstand infantry fire.

3. The great use that artillery can prove if brought early into action, properly massed for the artillery duel, and moved up to close ranges, in the infantry attack.
4. The new use of cavalry when thrown well to the front, to hide one's own movements, and to discover those of the enemy.

The whole of these four lessons were well learnt at the time. The first two are still remembered, and are never likely to be forgotten, all nations have more or less profited by them, as shown by their armies at the present time. The third was obscured by the war of 1877, and few perhaps, except artillermen, recognized that it was to the bad shooting made by the combatants, inferior armament, and radically unsound principles on which it was used, that the want of effect of artillery is to be ascribed.¹ In this light the coming war may prove (certainly if the Prussians are engaged) the glorification of the "mighty shrapnel," as Prince Kraft terms it. The fourth was well digested at the time, the Prussian Uhlan was a terror to the French, the pride of the German, and an example to the rest of Europe; but none the less gradually and quietly forgotten. The reason for this is not far to seek. Horses are expensive, hence nations like to keep as few cavalry soldiers as possible during times of peace. To counteract this, constant and frequent notice of the great use of the cavalry should be perpetually made, but as the use of the pen is chiefly made by Generals and Staff Officers who have often had little experience of the branch, this is not done, and the cavalry soldier is quietly shelved.

This is particularly the case with us as a nation, who are perpetually engaged in small conflicts with savage nations where infantry chiefly is needed.

We find that it was not till the earliest phase of the war of 1870 had passed that the discovery of the use of the Uhlan was made. But gradually the power of the Prussian cavalry was felt, and from the time they crossed the Moselle, they were pushed far ahead into the very heart of the enemy's theatre of action, paralysing his forces, terrifying the country people, and allowing the German leaders to deliver their blows when and where they liked.

When the campaign of 1870 is looked back upon, it is the use of the cavalry that stands out pre-eminently as unique.

But it must be remembered that the French did not use their cavalry in the same manner, it was kept back in the old traditional way for use on the battle-field; thus it never happened during the whole war, that a French cavalry Division met a German one in advance of the main body. Had the same use been made of the arm on both sides, great masses of cavalry would have been sent to the front, which would have fought obstinately for the ground, and whichever side conquered, would have reaped the overwhelming benefits which were secured by the Prussian cavalry with scarcely a blow.

¹ There were a few exceptions, witness Aladja-Dagh, where the effect of the shrapnel fire of the Russians is described by all as truly remarkable.

It was this absence of struggling that somewhat obscured the use of horse artillery in the cavalry screen.

But the importance of quickly getting the upper hand in this preliminary conflict has not been lost sight of by some of the European Powers, for it conveys the advantages of hitting a blind man with your own eyes open; and as cavalry aided by horse artillery must push back cavalry without guns, it is to the horse artillery that we have to look for this great and stupendous advantage. In such a position another battery of horse artillery may be worth its weight in gold; six guns one way or the other may turn the scale. I purpose, therefore, going rather further into the uses of horse artillery with the cavalry screen than I did last year. Napoleon had stated in a despatch to Paris after the initial reverses of the war, that he intended falling back "on our impregnable positions on the Moselle." Prince Kraft observes on this, that he has not yet seen in any military work any observation on the importance of the rapidity of the German cavalry's movements which had on the 13th August reached this river, thus forestalling the French in their intention of occupying this formidable line of defence, although in possession of a line of railway. If the enemy had been given more time to destroy the bridges of the Moselle between Metz and Nancy, fortifying its more dangerous passages, the events of the fateful days that followed might have been very different. But the fact was that all through the campaign the French quietly acquiesced in having their eyes thus blinded by the German screen.

The services rendered by the German cavalry from the 6th to the 13th August were great in the extreme to the invaders, but it was after the Moselle had been crossed, that their importance was still more fully shown.

The 5th Cavalry Division with the Guard Cavalry Division, about sixty squadrons in all, was pushed forward, after crossing the river at Dieulouard and Pont-à-Mousson, to Jarny and Rezonville, on the line of retreat of an enormous and as yet only partially defeated enemy, bivouacking 9 miles in advance of the only infantry Division that had yet crossed the Moselle.

It was on the following morning that the well-known surprise of the French camps at Rezonville and Vionville by the artillery fire of the 5th and 6th Cavalry Divisions took place.

On the 17th a brigade of the Cavalry of the Guard advanced as far as St. Mihiel on the Meuse, and reconnoitred the ground further west, thus giving two good days' notice of any attack that might have been in contemplation on the main body, and allowing the whole of the German forces between the Moselle and the Meuse to change their direction if necessary to the west or north with perfect safety. But as yet the cavalry of the attacking and invading army was only learning to use their wings. On the 24th August, when the German scouts had ascertained that the camp at Chalons had been abandoned, the cavalry Divisions that furnished these leading patrols were actually upwards of 40 and 45 miles from their corps. But as the cavalry columns drew nearer to Paris, where resistance might be looked for,

they had somewhat diminished this distance, and were only 27 to 30 miles ahead.

In the next European war, we are likely to see the commencement made with large masses of cavalry thrown forward on either side struggling for the mastery, and the victor driving the vanquished back till the former is from two to three days' marches ahead of his own forces; thus keeping the enemy in ignorance of his movements, while enabling his own attacks to be made when and where he likes, affording security and restful nights to his own infantry and artillery, and harassing, on the other hand, those of the enemy. Let us just remember in passing what this entails in the way of mobility, ammunition, and independence on the part of the batteries of the horse artillery employed with the screen on this duty.

But we must also bear in mind the cavalry raids that are likely to be attempted, and perhaps successfully carried out in the war of the future. The War of 1870 and 1871 gives us no example of this, from the fact that it can rarely if ever be attempted in an enemy's country. But the French, if they had had cavalry Divisions to use for this purpose, might have wrought irrevocable damage upon the invading hosts if the raids had been boldly carried out. The Prince, in his "Letters on Cavalry," says in his own inimitable style:—

"Imagine a raid by a French cavalry Division from Dijon by Langres, Bar-le-duc, St. Menehould, and Rethel to the northern fortresses. Favoured everywhere by the inhabitants, and warned in time of any threatening danger, hidden for many nights in the forests of Argonne, attacking and annoying our line of communications at such spots only as they knew from the people to be occupied by few or none of our troops, such a cavalry Division would have done us infinite harm; it would have disturbed our communications, destroyed the railways, cut off our supplies, burnt advancing provision columns, &c. . . . Such a raid, assisted as it would be in every village and in every town by its sympathizers, might produce extraordinary results; it might even, suddenly appearing in districts at a great distance from each other, serve as a nucleus around which those sympathizers might flock together, and thus 'call armies out of the earth by a stamp of the foot.'"

Such raids as this may yet play a great part in our defence of India, should our hold there ever be really menaced by foreign armies on its soil. But we have not to look to imagination alone for such an attack. Deficient in ability and skill as the Russian cavalry proved themselves in the War of 1877 and 1878, especially in securing knowledge of the enemy's intention and of harassing their retreat, as for example in the withdrawal from Tashkessen, yet they give us one grand example when properly led of a true cavalry raid.

General Gourko, in his admirably conducted movement on the Schipka Pass, had in less than a month gained possession of one of the principal passes over the Balkans from which they were never afterwards driven, while it was used in January for the crossing of a large portion of their army. But, besides this most material advantage, he had created almost a panic throughout the whole of Turkey

in Europe, subsisting on the country, and spreading destruction and disorder in all directions, uprooting telegraphs and railways, and collecting valuable information from all sides.

It is true that in this raid a large body of infantry (the force was composed of 8,000 infantry, 4,000 cavalry, and 32 guns) were used, but it is doubtful whether their presence conduced much to the success of the expedition after the pass was secured; their part was to hold open the door of the orchard while the cavalry secured the fruit, and in many cases it is conceivable that the cavalry Division will be able to play this part of the game also.

But, alas! this is the only use in a positive sense we can make of the Turco-Russian War of the use of cavalry, though we have abundant instances of its negative value.

Thus, with reference to advance guard work, Major G. S. Clarke informs us that though General Skobeleff with a flying detachment seized the bridge over the Sereth at Barboschi on the 24th April—the Cossack cavalry having started at 3 A.M., and reaching the bridge at 9 P.M., after a ride of nearly 65 miles—yet Plevna, only 35 miles from Sistova on the Danube, was not touched by cavalry patrols till three weeks after the crossing of the Danube! What a difference is this to the work of the Prussian Uhlan, yet the failure was not due, as we see, from want of mobility—65 miles in eighteen hours will require no bad battery of horse artillery to keep up.

Again, had the Turks after the first battle of Plevna possessed a sufficient cavalry force of the stamp they used to possess, the disaster to the Russian arms might have been complete. The pontoon bridge at Sistova was only 35 miles distant, and might easily have been seized for ought that the Russians could have done to prevent it. While the defeat after the second battle was such that a panic did occur there, notwithstanding the absence of any pursuit, and General Richter had even to bar the bridge by force of arms before he at last succeeded in allaying the alarm.

Had a single Prussian cavalry Division been present that day, for instance, the 5th under General von Rheinbaben, with its four horse artillery batteries, as on the morning of the 16th August, 1870, what a different ending the war might have had! What a hurrying and haste would have been seen among the already discomfited Russians; with the bridge firmly held, all the troops on that side the Danube would have fallen a prey to their hitherto despised enemy, and the great river might not have been so easily crossed again.¹

Nor were the Russians themselves better qualified to take advantage of a pursuit. Usually their cavalry never attempted to follow up a success, and though at times they did reap some advantage from thus pushing their successes, as for instance at Lovtcha, where the Caucasian brigade, with its Cossack horse artillery battery, claimed to have destroyed some 3,000 of the enemy by shrapnel fire, yet it never encouraged them to do more in the future, and time after time they

¹ Major Clarke estimates the Turks at 35,000, and the Russians at 22,000, at this time at Plevna.

allowed the Turks, who were almost absolutely deficient in the arm, to slip away from their fingers.

Valentine Baker writes from his own experience as follows: "The Russians had the great advantage of immense superiority in cavalry, acting in a country which was admirably favourable for its development, but they failed to derive the slightest benefit from this superiority. During the retreat of the Turkish forces, which terminated the campaign, endless opportunities were constantly occurring for the effective use of the Russian cavalry. When the Turkish armies fell back from the Balkans in a slow but almost uninterrupted retreat to the *Ægean*, almost destitute of this branch of the service, their movements might have been utterly hampered by active cavalry operations on the part of the enemy. As a rule, the outposts of the two armies were in actual contact, the main forces being separated by a comparatively small distance, yet on no single occasion did the Russian cavalry ever seriously press the retreat of the Turks."

The absence of this pursuit on the part of the invader is the more unfortunate, from a military history point of view, from the fact that it has prevented the weakness of the Turks in this branch of the service being much commented on. If there is one phase of action in which a properly provided cavalry force is useful, it is in the *rôle* of covering a retreat. This was the one duty that the German cavalry in 1870 never fulfilled. If the Russian cavalry had risen to the occasion, had, for instance, Skobeleff been charged with this duty, we should have heard more of the fatal want of cavalry stiffened with horse artillery on the part of the Turks.

In outpost duties, again, the Russians were lamentably wanting. General Valentine Baker, after his gallant and plucky defence of Tachkessen, was allowed to slip away with an ease that is simply incredible. Captain Greene, in his work, sums up this in one line:—

"On the next morning, January 1st, the Turks could not be found."

Once more let me bring to notice the utter failure of the Russian cavalry in preventing supplies from entering Plevna and in carrying out the investment on the western side. General Kriloff had as much as 56 squadrons and 30 horse artillery guns under his command from the 19th September till the 7th October, yet about all that he accomplished was delaying a force of 10,000 men for two days. Major G. S. Clarke remarks in his wonderfully interesting account:—

"The task of preventing the provisioning of Plevna could only be accomplished in two ways—either taking up a defensive position on the Plevna-Orchanie line and waiting to be attacked, or by rapid movements and vigorous offensive tactics. The latter course was the most natural *rôle* for a cavalry force. The country was favourable for the employment of the arm, the distance from Orchanie to Plevna considerable, and, except the *chaussées*, few if any lateral routes appear to have existed by which heavy transport was practicable, while a long train, extending over more than 7 miles of road, was not very easy to defend against a strong cavalry and horse artillery force. . . . Of the two tasks allotted to General Kriloff, the cutting of the Plevna communications and the sparing of his

troops, he had only succeeded in fulfilling the latter. After the great losses of the 11th and 12th September, it was natural for the Russians to wish to avoid further sacrifices, but fully admitting this, and also the difficulty of cavalry operations against modern infantry, it seems nevertheless that a *grand* opportunity for a brilliant and dashing cavalry General existed, and that it was lost."

I have given here more prominence to this failure from the fact that it would seem as if here too a new and important work is likely to be given to the cavalry Divisions, namely, the investing large sectors of fortresses in the future. Major G. S. Clarke himself quotes—and he is no mean authority on such a subject—a passage by Captain von Widdern, that—

"In future wars armies will often find themselves in front of fortresses which, on account of the extent of their works, cannot be completely invested. This observation applies especially to France as a theatre of war, where the task of observing much of their fronts and of intercepting their communications will be left to that mobile force *par excellence*, the cavalry."

For instance, a second siege of Paris will have to be very differently conducted to the last. The extent of the surrounding forts, now reaching to 104 miles, makes the necessity of leaving the investment of a large sector of the cordon to the cavalry an absolute necessity, and should an attempt to get in or out be suddenly made, to the guns of the horse artillery will have to be entrusted the detaining the disturber till other and extraneous aid appears. The cavalry Division will thus have, by constant and rapid changes of position, to deceive the enemy as to their strength and locality.

These are some of the ways in which cavalry Divisions are likely to be employed in the future when on detached service. Let us, therefore, now look a little into the duties required from the horse artillery attached to them; and it must be remembered that though only a proportion of the batteries may be thus employed, yet every horse artillery battery must be so fitted as to take its place when wanted in the cavalry Division.

Three things, then, are specially needed: 1st, the power of keeping up with the cavalry at all times and places under every circumstance of bad roads and wet weather; 2ndly, its ability to hit when asked to do so; 3rdly, its supply of ammunition in action.

With reference to the first condition, we have already had one instance of what General Skobelev demanded and obtained from his cavalry on a special occasion, 60 miles in eighteen hours. Prince Kraft, in his letters on cavalry, states:—

"1st. A squadron must be able to get over $4\frac{1}{2}$ miles at a rapid pace (trot or gallop), and must then have sufficient power left to make a charge and carry it through.

"2nd. Certain picked horses must be able to march great distances, say from 50 to 60 miles in a day, and thus it must be possible to carry out extended patrolling.

"3rd. The larger masses of cavalry must be in a condition to make long daily marches, and should certainly, to give figures, be able to

advance for three days at the rate of from 28 to 30 miles per diem. If these marches are to be continued for more than three days, the daily amount should be diminished, and if on any day the cavalry are asked to do more than usual, then the next day must be either one of rest or only a short march must be made on it.

“These exertions, whether of a single squadron or of a cavalry Division, must have *no influence* on the tactical efficiency of the force making them.

“This is not too much to ask. The cavalry can do it, have done it, and will do it, whenever they are asked, if only they are allowed the means to do it.”

I would specially draw your attention to the words “no influence on the tactical efficiency of the force.”

If Prussian cavalry can do it, and will do it, we may take it, I presume, that we must be able at least to do as much, even if we are contented not to do more, but it means a good deal, viz.:—Taking a horse artillery division with all their spare carriages and line of wagons 90 miles in three days and then having enough sound horses not to impair one's tactical efficiency. It means the guns being asked to do an occasional 60 miles a day, and some of the Officers and men sometimes riding close on 90 miles in the twenty-four hours.

One is proud of being able to say, like the Prince, “they have done it.” Last year I alluded to Captain Rodber's march of 95 miles in thirty hours, and his tactical efficiency was so little impaired, that he fought a battle at the end of it; and I have lately had my attention drawn to another battery in India that sent three of its guns, in September, 1857, from Mean-Meer to Gogaiya, a distance of 70 miles, in one march of sixteen hours, to save the Treasury there. The battery was then known as the 3rd Troop 2nd Brigade, Bengal Horse Artillery, lately L | B, R.H.A., one of the batteries recently reduced.¹ While, I believe, G | B this winter marched 166 miles from Neemuch to Mhow in 104 hours, without injury to horse or man. I allude again to the subject this year, as the mobility of horse artillery must never be lost sight of.

Having got the guns into the right place, the next thing is for them to be of use—they must hit; and this introduces what I have alluded to above—“The mighty shrapnel.”

The subject of accurate and well-directed shooting from field-guns is one that some cavalry soldiers are inclined to pass by as one concerning the artillery alone. This is surely a mistake. First it concerns them much as a partridge is concerned with the shooting powers of fowling-pieces; secondly, as one is personally interested in one's friend's ability to hit when after tiger with him. If two cavalry Divisions of equal strength are engaged together, and the artillery of one hits nothing and the other shoots really well, victory is likely to be assured to the latter, while it will be cold comfort to the horse artillery of the former to know that it did nothing effectual because it was assigned an impossible task by its cavalry General. Not that it is

¹ From the records compiled by the present Inspector-General of Artillery in India, Brigadier-General Nairne, C.B.

necessary for a cavalry leader to know technical details connected with artillery, but it is absolutely essential for him to know when and where he can rely on his guns, in order that he may use them as a weapon for attack and defence. Let us then briefly consider the three kinds of projectiles with reference to a cavalry engagement.

Each case-shot contains about 314 bullets. There are six rounds (two with gun and four with limber) present with the gun. Owing to their proximity and the absence of any required preparation, the whole thirty-six rounds could be fired while cavalry are advancing on the battery during their last 500 yards, for four rounds per gun can be fired in a minute. After leaving the gun the case-shot bursts, the bullets form a cone and strike the ground in the shape of an oval. The harder and smoother the ground, the more effective will be the result of the fire, as the balls will ricochet. The lateral spread can be roughly given as—

Range 100 yards.....	17 yards. ¹
,, 200 „	24 „
,, 300 „	42 „
,, 400 „	53 „

As the guns stand at about 20 yards interval their fire thoroughly sweeps the whole front, and consequently a front attack either from cavalry or infantry *can never* be successful if the gunners are prepared for it. Before dismissing case one may remark that it is a similar projectile to the old canister. For its effects, therefore, we can turn to history.

Not so, however, with shrapnel, our next projectile to discuss. Here, owing to rapid modern improvements, we have nothing to guide us but that fallacious test—the practice ground.

In the war of 1870 and 1871 little shrapnel was used, so little as to be useless. Thus on the 16th August out of 6,259 rounds fired by the German horse artillery only six were shrapnel, and on the 18th August out of 8,538 only nineteen were shrapnel. In the Turco-Russian War more shrapnel were used, but the fuzes were bad, the way the guns were employed worse, thus little reliable data are to be found.

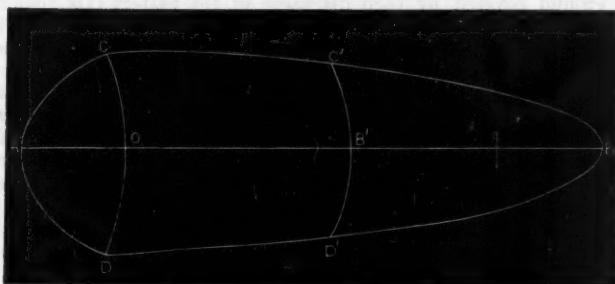
I shall allude directly to the enormously destructive power of common shell, as evinced in the Franco-German War, but must here state that the destructive power of shrapnel on men and horses over common shell is (we gunners affirm) something like as 5 to 2, when used in conjunction with a good time fuze, and we now pride ourselves on having the best in Europe—the T. and P. short.

The following figure shows the ground covered by the bullets (177, weighing about 5 lbs.) after they have hit the ground and before they have ricocheted.

Half the bullets will fall on either side of COD. The effective beaten surface is that comprised between ACC' B'D'D, and is all that

¹ See Major Eden Baker's "Notes on Tactics."

should be taken into account. As the range increases the frontage covered by the effective bullets (CD) increases, while the depth covered



(AB') decreases; a similar effect is produced by increasing the length of the burst. This is shown by the two following tables.

50 Yards Short Burst.

Range.	CD.	AO.	AB'.
500 yards	12 yards.	45 yards.	400 yards.
1,000 "	17 "	42 "	377 "
1,500 "	21 "	37 "	344 "
2,000 "	25 "	35 "	337 "
3,000 "	29 "	29 "	291 "
3,500 "	27 "	27 "	200 "

100 Yards Short Burst.

Range.	CD.	AO.	AB'.
500 yards	14 yards.	90 yards.	410 yards.
1,000 "	22 "	83 "	356 "
1,500 "	30 "	74 "	319 "
2,000 "	37 "	69 "	296 "
3,000 "	42 "	59 "	270 "
3,500 "	42 "	55 "	256 "

The practical effect of this is shown by the large amount of ground covered by the bullets of a shell. Thus a squadron of cavalry in squadron column advancing on a gun would at 1,000 yards distant be within the effective zone for 377 to 356 yards, according as the shell was burst short or long. This shows how very difficult it would be for the gunner to miss doing some damage, especially when it is remembered that it is always easy to hit the right direction, the difficulty has been to ascertain the range.¹ When it is further considered that on hardish ground all the bullets which fall in ACOD will

¹ I have taken these tables from Major Eden Baker's valuable work on "Preliminary Tactics." Till my attention was drawn to it I had a much hazier idea of the action of shrapnel.

ricochet so as to supplement the bullets already fallen in the greater space CC'D'D; while those already there will ricochet further yet, the ground covered by each discharge of the battery (six rounds) will be very considerable, as can be seen in Fig. D (Plate). The leading regiment is here shown in line; in line of squadron columns it will be far more exposed.

Besides being burst in the air with a time fuze, shrapnel can be made to burst immediately after impact with a percussion fuze. This entails less preliminary preparation, which is, however, of little consequence, for when an enemy is advancing on the battery, shrapnel can be brought up and laid handy with their time fuzes set for ranges differing by hundreds of yards.

Effect is here taken alone of the bullets ricocheting, as in the diagram. It is very much more effective at the shorter range, both



from the greater striking velocity and smaller angle of descent. With percussion shrapnel the cone of dispersion of the bullets, unlike that of time shrapnel, acts upwards; the result being that many of the bullets fly too high to be effective, and when they descend again are practically useless from having lost too much velocity. The worst feature, however, regarding the use of percussion shrapnel is that when the range is not very accurately known, the result produced will probably be *nil*. By some, great reliance is placed on percussion shrapnel; I own myself to being prejudiced against its use with a cavalry brigade, owing to the quality it possesses with time shrapnel of all absence of noise. It used to be said that artillery fire was principally felt in its moral effect; since the late Franco-German War, however, this can no longer be alleged, while shrapnel has even since then enormously increased its man-killing properties, but unfortunately in moral power some of its increased effect has been counterbalanced in two ways: first, the terrible wounds inflicted by round shot, that used to shake men's nerves, no longer occur; secondly, the loud reports of the shell bursting have been exchanged for slight puffs. A good instance of the former is given in Mercer's "Journal of Waterloo," where a single horse struck by a round shot seems to have produced a more sickening effect than the large number of men killed and wounded

later. In time of peace, probably few are aware of the loud noise made by a common shell bursting. At one station I was in there was a large and substantial splinter-proof shelter for a range party. One day when on range I placed the target just behind the splinter-proof where we were, and observed that when shrapnel was fired I had some difficulty in preventing the other members of the party from putting their heads out to see what was going on, but when common shell was fired there was no necessity for saying a word, nobody wanted to move. A horse that stood fire perfectly I also took into the butt, and when common shell was fired and burst near, we had some trouble in preventing him from breaking loose.

I own, then, when firing at cavalry to have a fancy for common shell owing to the disturbing effect it is likely to have on the horses.

Nor am I alone in this. Von Schell (Chief of the Staff to the Inspector-General of the Prussian Artillery), says: "Against rapidly moving objects, such as we encounter in a cavalry action, shrapnel is too difficult to manipulate, in addition it is no easy matter to follow the enemy's movements with it, while the comparatively long time required to load with this projectile does not conduce to rapid shooting."

The small puff of the shrapnel, too, horses will not notice, but the loud report of the common shell, bursting with unexpected and lightning-like rapidity, will startle many of them, rendering them most unmanageable. It is unfortunate, however, that the 12-pr. steel common shell may only break up into three or four pieces. On the other hand, if shrapnel is so destructive in killing men it may have a ten-fold effect on horseflesh at times. For instance, at Vionville, the artillery lost in killed 29 Officers and men, 228 horses, nearly seven times as many; at Gravelotte, 26 Officers and men, 324 horses, over twelve times as many. Now, if this was the proportion where the horses are often under cover and the men usually, if not invariably exposed, in the cavalry we may expect great losses in horses from artillery fire.

A good instance of the destructive effect of common shell against horses is mentioned by Prince Kraft; he says:—

"At one moment something was seen moving to the right in the forest of the Ardennes. By the help of field-glasses this was made out to be some cavalry marching in two ranks towards the north, and passing through a clearing in the forest on the hill. The batteries endeavoured to find the range. With elevation for a little more than 4,000 yards we appeared to hit. I considered that the range was too great for the fire to have any effect, and I was about to order it to cease, when an evident disturbance in the ranks of the enemy proved that our projectiles had reached him. We continued then to fire slowly at this moving target, as long as it remained visible. On the following day, Lieutenant v. Kaas, while doing duty as aide-de-camp, passed by this point, and found on a narrow crest which ran between very steep ravines an entire French battery which had been abandoned there. The team of the leading gun had been blown to pieces by our shells, and the other guns could not pass it; thus the whole battery fell into our hands a trophy of the accuracy of our fire."

Yet this gun could not be compared with our new 12-pr. B.L. in range, shooting power, or accuracy.

In Fig. C (Plate) I have taken an illustration of two cavalry brigades advancing directly on one another, one of which has a horse artillery battery. I have presumed that the battery gallops straight to its front, coming into action at a distance of 1,300 yards from the enemy, who, up to this, would be only pressing forward at the trot, now changed to a slow gallop of 12 miles an hour.

When he is at 400 yards from the guns, they cease firing on the leading line, having been able during the 2' 40" of its advance to fire 18 rounds of shrapnel or 24 of common. If the former a total of 2,180 bullets. Its own cavalry then are in position to charge themselves on this advancing line shattered more or less by fire, with gaps in its ranks, and horses unsteady; the battery is then able to turn its attention to the 2nd or 3rd line according as its fire is less masked by its own troops. These would be still 650 and 1,000 yards off. Thus, there would be ample time for it to deliver an effective fire before its own 2nd and 3rd lines became engaged. The best thing that could happen would be for one of the lines to attempt to charge home, thus rendering it liable to a heavy loss from case, and being attacked in its turn by cavalry when its ranks were more or less opened out to avoid the guns' fire. Fig. D shows the same attack when near with the effective zone of a round of shrapnel marked against it.

In Fig. E, I show the same encounter, only the battery's cavalry are at first masked by a fold of the ground, hence, after the battery has galloped forward and begun to fire, its opponent finds that he has to change direction to his right, in order to meet the opposing cavalry on his right flank. Here the horse artillery would have an even better opportunity, and would be able to continue its fire almost up to the very moment of encounter.

Explanatory Footnote to Diagram.

The distance from the battery to the first position is taken as 1,300 yards, when firing begins, it is continued to the second position, 400 yards off. The time taken to advance this 900 yards is $5' \times 900 \div 1,760$, i.e., 2' 37". If we allow 1' for the first rounds, and 45" for the rest, this will give 3 rounds per gun, or 18 rounds in all; a total of over 2,180 bullets.

I have assumed that at 400 yards firing ceases at the first line to allow its own cavalry to charge. The second line is still 650 yards off, and the third nearly 1,000. There would therefore be abundant time before the latter could charge the battery to fire at it 3 rounds of shell and 1 of case, if not 2, per gun; a total of 18 shrapnel and 6 or 12 case. If it attempted to gain a flank it would offer even a better chance of being cut up, as it would have to wheel by troops and deploy again under fire, while the battery would change front in less than a minute.

I have purposely shown here no opposing battery, as by so doing one sees better the invaluable use guns may be in cavalry combats.

Where both sides have artillery, success is likely to result to that side which uses its artillery to most effect. In this term I include tactical advantages and good shooting. It will, as a rule, be best for the battery even to endure a heavy fire from the enemy, rather than give up firing at the cavalry, for final success must be decided by the

FIG. C.

Scale 450 yards to 1 inch.

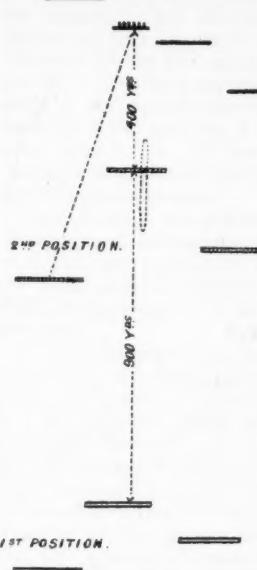


FIG. E.

Scale 450 yards to 1 inch.

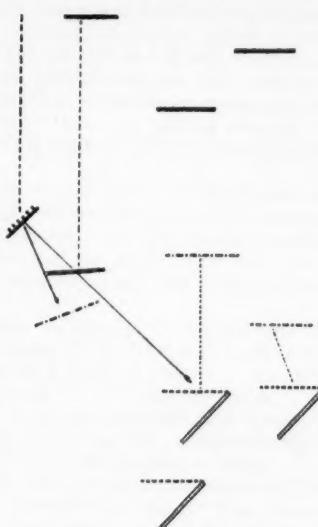
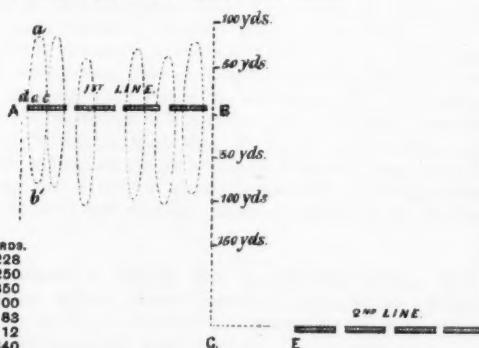


FIG. D.—CAVALRY BRIGADE ADVANCING TO ATTACK.

Scale 200 yards to 1 inch.

BATTERY FIRING SHRAPNEL AT 1,000 YARDS RANGE.



Number of bullets in the size (u.c.o.d.) is 530.



arme blanche, thus, no efforts should be spared to break the ranks of the enemy before the charge takes place. In many books on tactics one sees diagrams in which the horse artillery are shown in different places for action. A cavalry encounter takes place so quickly and ends so rapidly, that till one side is defeated, I believe the artillery will usually not change its ground after its first position has been taken up, and that if this should be a bad one, nothing can hereafter atone for it. If there is more than one battery present, they must not be separated, as by so doing, their fire-effect is less, and their risk of capture greater.

I much wish the authorities could see their way to occasionally allowing such examples as this to be worked out in practice at targets with a cavalry brigade on rough ground, when the cavalry could see for themselves the effect of our fire, and we could learn how far we could gallop ahead with the best advantage, and the best position to take up.

With reference to the third point, the supply of ammunition, there are many, I am afraid, like the German Officer who said, "As soon as you begin to talk of lines of wagons, I begin to feel ill." But yet it is a theme that cannot be confined to the artillery alone. The Divisional General must at least recognize the difficulty in carrying out the renewal of ammunition in action, and the remainder of the command must be forbearing in allowing the wagons to pass.

General Sir David Wood, G.C.B., who has seen much horse artillery work in all its phases, recently remarked to me: "You have no idea how quickly 36 rounds a gun go in action." And though cavalry actions are proverbially soon over, yet, allowing an interval of 6" per round, in less than $3\frac{1}{2}$ minutes the whole of your limber boxes will be empty. Thus, it will be necessary, even when the horse artillery brigade are on detached duties with cavalry, for the first line of wagons to be kept close to the guns. This alone, when a battery is detached, will give many a *mauvais quart d'heure* to the battery commander, as he will often be unable to spare an Officer to be with them. On the other hand, the second line of wagons need not be kept so close to the front, as there will never be occasions likely to arise when the ammunition is needed in less than an hour; while on account of the roads being fairly free, in that time they will be able to come 5 or 6 miles. When acting as corps artillery however, the second line will have to keep much nearer, both on account of the greater likelihood of being wanted, and the far more crowded state of the roads.¹

Having thus considered a few of the multifarious duties of a cavalry Division when acting alone, together with some of the requirements it entails on the horse artillery, we get to the important question as to the number of such guns needed.

To arrive at a satisfactory and fair solution of this, we can hardly

¹ In speaking of the 1st and 2nd lines of wagons, I am not alluding to the Divisional Reserve Ammunition Column, but to the battery wagons divided into two lines, as is now ordered by the New Drill Book.

do better than see what qualified experts advise. Perhaps the best we can call upon as evidence is the great master of modern artillery, Prince Kraft of Hohenlohe, of whom Colonel C. B. Brackenbury writes: "Prince Kraft is far from being a mere artilleryman. When I had the honour of being introduced to him at Berlin, he was described as the deepest student of general tactics in the whole army."

This witness is the more valuable, from the fact that, while a gunner, he is by no means too prepossessed in favour of his own arm. In his letters on cavalry, in the first nineteen there are only, I think, six allusions (each short as a rule) to horse artillery, and of these six, two are allusions to past history, and three are introduced only to prove the evil that wheeled carriages must prove to a cavalry force. While the twentieth letter, treating on the use of horse artillery with cavalry, is only five short pages, and is headed with an apology for mentioning the subject at all, which he says he does, only because he is asked. This unbiased witness, therefore, briefly says that in the days gone by, the old theory was to attach three or four guns to each 1,000 troopers, while the German Regulations leave the question open.

The Prince declares that such a practice is founded on no solid basis, that a cavalry Division is often split up when acting independently into two or three brigades, and that as it is absolutely necessary, if a brigade has to occupy and hold its ground, for it to be accompanied with artillery, and while each of the three brigades may be thus at times so employed, in his opinion to avoid the terribly fatal error of breaking up batteries, there should be as many batteries as there are brigades. This is looking upon it from the cavalry standpoint. Turning to that of the artillery, he maintains that it is fatal to the efficiency of a battery to take its Commander away from his own battery work, to follow the General of the Division through a whole campaign; and that as one battery may frequently have to be detached from the main body for separate work for short intervals, the horse artillery Commander should never be given a less command than three batteries.

But these two double rules the Prince supplements by a third, that as far as I know, is not sufficiently considered:—

"I may sum up my opinion with regard to the posting of horse artillery to the cavalry Divisions by saying that I think that a complete brigade of horse artillery ought to be attached to every independent cavalry Division which is intended to work under the direct orders of the Commander of the army, and to be released from all control of any Corps Commander; and that this brigade should be formed exactly as it is at the mobilization, that is to say, in our case of three batteries, no matter whether the cavalry Division consists of 20, 24, or 36 squadrons, or whether it is divided into 2 or 3 brigades."

It is to this rule that I wish to call especial attention, that a weak cavalry Division should have as strong a force of guns as a strong one.

In the now famous "Letters on Artillery," the Prince is again sparing of his notices on horse artillery, though it is true that in the historical

parts in which he alludes to the services of the German artillery in 1870 and 1871, he has, for once, to be prodigal in his allusions to them.

But in the last letter, the eighteenth, published after the rest of the series, the Prince alludes to criticism on this very point that he has enunciated above, and which I have specially drawn your attention to. He says :—

“ To the last letter which I wrote, you sent me the answer that if a whole brigade were attached to a cavalry Division, the latter would become too clumsy, as the brigade would be like a leaden weight hung on to it. This is quite true in theory, but in practice it is by no means the case. Three pounds are certainly heavier than two, and therefore three batteries must certainly be heavier than two. But this is not altogether correct, for three batteries can trot as fast as two. A cavalry Division fully equipped for detached duties has many other leaden weights to draw after it, all of which fetter its flight, as, for example, field hospitals and provision columns. On the other hand, the addition of one battery creates no new impediment. If only the mounted detachments be kept well closed up, if the brigade be employed as a principle only in mass, then it makes no difference as far as regards the mobility of the Division, whether there be two or three batteries. But it makes a great deal of difference as regards the fighting strength of the Division.

“ In war, no Division would find three batteries too many, rather it would possibly find them too few. Did not General von Voigts-Rhetz at once increase the horse artillery of the 5th Cavalry Division to four batteries? With these Major v. Korber, at Vionville, surprised the French camps. They will only be found to be too many in peace, when no one knows exactly what to do with them.”

But if the Prince is in favour of “ richly endowing ” the cavalry Division with guns, he is by no means in favour of doing the same to it with rifles. He considers the number of men that can thus be sent to the front too few to have any permanent bearing on the action of large masses of cavalry : and useful as mounted infantry may prove in small wars and engagements, it would seem as if there was a large preponderance of opinion opposed to their use as summed up as follows :—

1st. They might sometimes lead to a muddle as regards the command of the force engaged. The Cavalry Commander is not accustomed to leading or using infantry : he will seldom have had experience in it, and might at times, while in action, be superseded by a senior infantry Officer with brevet rank, when a new procedure might occur, ending with the cavalry being improperly handled.

2nd. The number that can be brought into action thus is small, owing to the necessity of horse-holders. This is a difficulty that has hardly been fairly grasped. The horses must be kept under cover, hence often away from the men in action ; while if artillery fire plays on them, serious trouble will result by

horses breaking loose. The difficulty, too, of forage is increased.

- 3rd. The number of horses for a campaign is limited, thus it must be proved that this is the best way of using them.
- 4th. The men will not be seasoned to ride: they will be soft and gall easily, their horses are likely to suffer from insufficient care and attention. In no way are they likely to fulfil the requisites for mobility given before.
- 5th. The best marksmen are not the best riders; while hard riding is not conducive to good shooting.

Thus it is likely to be found after a few weeks' campaigning, that the General of the cavalry Division will be wanting to take their horses from them and to give them to the cavalry, looking to his guns for defensive action.

Whether it might not be wise to consider more carefully the stamp of transport horse, so that when a necessity arises, infantry can be pushed forward in transport vehicles, is another point. Colonel v. Löbell, in his annual review on war changes, says: "A general agreement has further been arrived at on the Continent in regard to mounted infantry, which, as an organization for European warfare, does not find favour; and even Russia has modified the views previously held in regard to it. The advantages to be gained from its employment out of Europe, in Colonial wars, &c., are generally on the other hand acknowledged."

As, however, we are not likely to be beaten in any of our small wars, we can pay the less attention to this, and prepare for graver struggles.

The somewhat kindred subject of dismounted cavalry in action may be shortly considered. In large operations it must be out of place, but occasionally it may be necessary to make a feint of holding a position when the joint action of guns and carbines may have a good deceiving effect. Thus a good instance of the use that can be made of dismounted cavalry is supplied by an incident in the operations on the Upper Lom. In the Turkish advance from their position behind the Kara Lom on Biela, Colonel Valentine Baker had ridden forward to reconnoitre, and observed a large body of Russian cavalry on the point of occupying a wooded knoll that was the key to the whole position. To prevent them, not a moment could be lost, for if the Russians occupied the ridge of the wood, they would be able to see the road that ran through the valley from Sarnasufflar, and could judge of the strength of the advancing column. A young Circassian who had previously ridden forward assured him that the approaching force consisted of 3 squadrons of Cossacks, 4 battalions of infantry, and a battery of guns. The only Turkish troops near were 6 weak squadrons. Colonel Baker directed 2 squadrons to move up rapidly and occupy a small hill on the right of the wooded ridge, 2 squadrons to occupy the ridge itself, and the remaining 2 he took with him forward along the road. The Cossacks had already reached the skirts of the wood as the party arrived, but the Turkish cavalry

galloped so boldly forward that they fell back on their supports, about 400 yards in rear. Another party of Russians had also taken position on the hill on the right, but the Turks, dashing up at a gallop, threw them back, too, into the village.

All at once, at 1,000 yards distant, appeared a line of infantry skirmishers stretching right across the valley. Three battalions of infantry in column could be seen behind them, and a battery of artillery was taking up its position in rear, and at once opened fire. It was impossible for the six weak Turkish squadrons to hold at bay such a force for long if seriously attacked, but if time could only be gained, reinforcements might be hurried up. Colonel Baker therefore fell back from the open ground in front till *within* the shelter of the wood; here he dismounted some of his men, with the direction to hold the edge as long as possible, while he set about trying to obtain some support. The ruse answered admirably: the Russian columns halted and made preparations for a regular attack upon the ridge and wood. Soon a strong Turkish infantry battalion came in sight, and it was not long before they re-took the ground in front of the wood, driving the Russians hastily to the rear, pursued by the very thin line of skirmishers and the six squadrons of Turkish cavalry. Evening was rapidly approaching, and the main body of the Turkish forces being near, the position was saved.

In thus taking farewell of the horse artillery in its primary use, *viz.*, with a cavalry Division, I have of course by no means exhausted all the ways in which it is likely to be used in the future. I have studied to represent some of its more striking features only.

PART II.

There is less need to speak of the secondary use of horse artillery, not that it is one whit less important than in what I have termed its primary use, but because the subject of corps artillery is one that is oftener spoken of in connection with artillery subjects.

But it must not be forgotten that these horse artillery batteries of the corps artillery, while called upon to perform equal work with their slower moving brethren of the field artillery, must never allow their mobility to be decreased by too heavy an armament. Not only must they be capable of being rapidly pushed into action at the call of the Corps Commander, but at any moment they must be ready to hasten on with any body of cavalry to which they may be attached. The great value now placed on the fire of artillery is thus evinced by the fact that no batteries will ever in future be allowed to stand idly by, doing nothing, whether they form an integral part of a cavalry Division or not.

So important is this *rôle* of horse artillery that I would like to draw attention to the action of General Freiherr von der Becke at Vionville, on the 16th August, 1870, who, we are told on the authority of Captain Hoffbauer, refused to allow Major Korber's two horse artillery batteries to rejoin their cavalry Division, even when summoned to do so by a special orderly Officer in the afternoon, though he had

then under his command seven other batteries, while the cavalry Division had been purposely increased to four batteries that very day, and it had been seen how useful they could be that morning when they surprised the French camps. If it be true that horse artillery is expensive to maintain, in war it is ever in use, in advance, pursuit, outpost duty, or in a heavy engagement. There are, however, some features of this secondary use I wish to mention. One is the subject of shields.

In the July number of the "Nineteenth Century," of 1878, appeared an excellent article on "Ironclad Artillery," advocating shields for field artillery. The writer, Colonel C. B. Brackenbury, founds his article, which is worthy of a far more lasting position than the pages of a monthly magazine, on the enormous effect produced in the war of 1870 by the German artillery at short ranges by guns of very inferior power, firing only common shell, but massed in large groups of 100 guns and boldly used. The effect of shrapnel by such a gun as our present 12-pr. will be far and away more destructive, provided it be possible to continue in action without losing all one's men. The writer alludes to the almost total immunity enjoyed by the matériel of loss or damage. This is shown in Appendices III and IV of my last lecture, where, on the 16th August, 1870, the German horse artillery lost 358 horses and 179 men, but had only a limber-box and a gun-wheel damaged, and on the 18th August, with 524 horses and 238 men killed and wounded, the only damage was three wheels, a pole, a breech-piece, and an axle-tree seat. Colonel Brackenbury finally recommends shields of wrought iron, soft enough to allow shells to pass through, but strong enough to give protection to the detachment from bullets and shrapnel. For field artillery such cover would often be simply invaluable, allowing the "action numbers" to remain at their guns when exposed to an infantry advancing upon them with almost total immunity to loss, at the very shortest ranges.

The only question that can arise, is to the disadvantage of carrying an extra weight. Two plans suggest themselves, one to have the shields attached permanently to the gun-carriage, so that they would lift up on hinges, to cover a man's head and shoulder—for instance, the top of the axle-tree seat could thus lift up towards the muzzle; or the shields could be made removable and carried on a separate cart or wagon. I am not now speaking of field artillery, but have introduced the subject because I believe that it will eventually come into universal operation, and if so, it is clear that if horse artillery batteries are to take their place in line with field batteries it will be necessary to give them the same protection. As the shields would seldom be used when in action with cavalry, I would not venture to impair the guns' mobility by making them permanently attached to the gun-carriages. I would rather see them carried on another carriage, and not brought up into the first line of wagons except when the battery is being used as Corps Artillery. Should the battery when thus employed have to be detached again to join the cavalry, it could leave the shields on the ground.¹

¹ Major Elles in his Silver Prize Medal of 1879 advocates a light steel shield

While on this subject I may add that I should like to see the tugs of the shaft horses no longer of the present pattern, but open, like the patent tugs of private harness, thus much facilitating hooking in; a great advantage in the case of a wheeler being shot or hooking in fresh horses under fire.

Now for armament. The one great point to settle is, whether it is necessary to have a lighter gun than the field artillery gun.

It is quite certain that the present 12-pr. is not too heavy for them, while, mounted as it is, it is certainly too heavy for us, weighing, without the two limber gunners, 39 cwt. 11 lbs.

The question is, could this weight be so decreased as to send it into the field with only some 35 cwt. (including everything behind the splinter-bar). I think it might. Perhaps the weight of the carriage might be slightly decreased.

Stores, amounting to 184 lbs., now carried on the gun-carriage, might be carried elsewhere. Lastly, if necessary one or both of the limber gunners might be mounted, as in the Prussian horse artillery.

In addition, the weight on the horses' backs might be sensibly decreased. Principal V. S. Fleming lately stated in a lecture at Aldershot that the weight carried by the near wheeler of a horse artillery gun was, with a 12-stone man, as much as 22 stone; and though I do not make it quite so much, yet undoubtedly it could be much decreased, thus affording sensible relief.

Whatever gun is finally settled on, its term of service is likely to be short; invention, with rival companies treading on each other's heels, follows speedily; quick-firing guns only await a smokeless powder, and there is a possibility that field howitzers may yet have a place on the field of battle.

PART III.

In a recent number of the Institution Journal there is a short paper entitled "Horse Artillery in Various Armies," by Captain Callwell, of the Intelligence Department, and as my name is linked to this communication in a footnote by Colonel Hale, and the whole communication is a critique on Appendix VII of my first lecture on "Horse Artillery," I can hardly be considered guilty of temerity in alluding to it. I propose first accepting, as we have a right to, that the figures given from such authority are correct, and examining the deductions drawn from them. Three tables are given: Table I, "Peace Establishment;" Table II, "War Establishment;" Table III, "Field Artillery."

As nations, unlike individuals, do not unfortunately fight like pugilists sometimes with gloves, sometimes without, it is, I think, useless to discuss the first, "peace" establishment; no nation is ever

$\frac{1}{8}$ inch thick, weighing only 7 lbs. 10 oz. per square foot. This gives a total weight of 167 lbs. with the gun, and 78 lbs. for the limber, a total for the spare cart to carry of 13 cwt. and 14 lb. This would be somewhat decreased by the weight of spades and shovels now strapped to the gun, for if shields be used, gun-pits will seldomer than ever be dug. Everything points to the infantry using the spade more, the gunner less.

likely to challenge us to a more or less friendly contest with our troops at present serving with the colours. War is far too serious a business to be conducted like that. It will be more than a matter of life and death of individuals, it will be a struggle for existence for the nation itself, and the amount of troops we have on our peace establishment is as much our own private affair as the amount of capital at the disposal of a private bank is of the proprietors. Even if our means and ways of mobilizing were the same, for instance, as other Continental Powers, it would be at the best a most fallacious test.

As regards war establishments, the number of guns, horse artillery, given as per 1,000 cavalry are as follows:—England, 2·3; England and India, 2·2; Germany, 3·3; Russia, 2·0; France, 3·4; Austria, 1·5.

It is difficult to see in the light of these figures how Captain Callwell can maintain that we are not weaker than our Continental neighbours in horse artillery. Germany here comes into the field not with three horse artillery guns to each of our two (she has, owing to her total strength, nearly six guns to our two), but with equal bodies of cavalry she can allow three guns where we allow two; in other words, with a cavalry Division of 3,000 sabres she could allow 9·9 guns where we should have only 6·6, while France could even allow a fraction more, viz., 10·2 to our 6·6. What is Captain Callwell's explanation of this table? He says:—

"In Table II, where the proportions of horse artillery guns to 1,000 cavalry are less than in Germany, the cavalry include yeomanry, which can only serve in the United Kingdom; excluding yeomanry, the war establishments of cavalry are very slightly larger than the peace establishments." And elsewhere he says, "That no horse artillery exists in this country for service with the yeomanry is in accordance with the general practice abroad." The yeomanry are either of use or they are not; if the latter, the sooner they are disbanded the better; if, however, their utility is admitted, and I for one claim them as a most valuable adjunct in war, both in case of home invasion, and in a serious struggle abroad as volunteers for the ranks of our far too few cavalry; then why, in the name of common sense, refuse them the advantage of artillery? But even admitting, for the sake of argument, that it is wise to deprive the yeomanry of horse artillery—and I will admit it on this one ground—then the peace figures alluded to above do not much help matters, only raising the percentage to 2·6 for England and India.

In the third table, entitled "Field Artillery," India is unfortunately omitted. This robs the figures given of much of their value, as it is only by calculating India that we arrive at anything like a true state of affairs.

But does any one soberly suppose that if we go to war we can confine our operations to two army corps of the strength given? If we are to we shall indeed do badly. Supposing war between two Continental Powers, in which we get drawn in, no such improbable event, will either of the combatants be satisfied with us as an ally if we can coolly talk of supplementing their 18 or 19 army corps with only two more? Of adding one weak cavalry Division to their

9 or 10 strong ones? Are our Indian Princes' irregular cavalry to be unused altogether because we happen to have made no arrangements in peace for them? And above all, are the remaining cavalry, infantry, and field batteries, &c., in the United Kingdom, amounting to the difference between the two army corps and 80,000, not to be utilized in any way? But are Captain Callwell's figures correct?

In Table II he says: "Dépôt horses and field batteries, &c., have been counted, since in the case of invasion, the dépôts would certainly be used as service batteries." Is Captain Callwell aware that the actual needs of the horse artillery batteries in India this winter season amounted to upwards of 350 men? Many of the batteries needed over 40 men sent out to them.¹ Even supposing the horse artillery dépôt had been strong enough to supply these needs, only recruits almost utterly ignorant of the higher needs of their duties could have been supplied, men some of whom had never yet galloped with a gun into action, none had ever seen a single shot fired. Had war been proclaimed, as far as India was concerned, none of these men would have been fit for their posts in English horse artillery. Thus out of the 11 batteries in India only 9 could have been sent on service. But alas! the dépôt was too weak to supply this call, and on an average 10 men had to be taken from each of the service batteries to help the Indian batteries, thus seriously crippling some of those at home. Hence, instead of the dépôt being of use as two fresh batteries, they were depleted of men, and yet were too weak to fulfil their own duty. Oh! but the reserve? The following table shows how far we can rely on this:—

Wanted to complete 5 batteries on the higher establishment up to war strength.....	85 men, 370 horses
Wanted to complete 4 batteries on lower establishment	212 „ 401 „
Wanted for men supplied to India to complete their normal needs	93 „
Under strength, say 6 per battery and 10 per cent. unfit for campaigning..	170 „ 85 „
Total required about	560 men, 856 horses

Against this we have, I suspect, between 600 and 700 men of the First Class Army Reserve, who would have to supply not only these 560 men but complete the batteries in India.

H.R.H. the Commander-in-Chief has himself said, "The artillery is a very delicate arm, and I certainly should not have confidence in a horse artilleryman after he has been away a year." In face of this may one not wonder how these 560 men are to be supplied?

But to return to our dépôts. How about the horses? The dépôt horses, fit as they are for their present work, are quite unfitted for

¹ 40 men going and another 40 coming considerably upsets a battery's efficiency.

active operations; probably not 10 per cent. would stand a campaign of seven days' duration.

But the guns, equipment, &c., are of use? Yes, the old 9-pr. M.L. may be if ammunition could be found for it in the Arsenal and wagons provided.

Thus, instead of placing our horse artillery guns at home as sixty-six in number, I aver that with so much to arrange and equip them for service, it is far truer to place them at forty-six as I did in my last year's paper.

But it is with Table III that Captain Callwell scores heaviest, bringing up his number of horse artillery guns per 1,000 cavalry to 7, and to 100 field-guns to 36. Now this table is a misleading one. It is headed "Field Artillery,"¹ which I am now told is a misprint for "Field Army," but having no notes or comments it was difficult to guess what it was. The number of horse artillery guns have risen 2 from the peace establishment, but the field guns have diminished from 200 to 132.

It is apparently a table showing the number of cavalry and horse artillery in the two army corps. I do not care to dispute this portion.

I maintain that having sent off these two weak corps, you have left in the country, either against possible invasion or further operations on the Continent, a large force of infantry, cavalry, and field-guns with only six horse artillery guns. Instead of forming or trying to form new batteries then, I recommend by the comparison of former wars that it should be done now, even at the expense of other things.

Another point where I maintain we have shown short-sightedness in not maintaining a much larger force of horse artillery, is that we cannot but rely in our next European war largely on mercenaries, and these from the very nature of the case cannot be anything else than infantry and cavalry. Once war is proclaimed England will enter the market for soldiers. Cavalry will only be obtainable in the East. Our own native cavalry regiments will prove invaluable, but will not alone be able to supply the whole need for that arm, far from it. It is to the great native Princes that we shall turn for assistance, and will readily get it, but for artillery and horse artillery in particular they have none and never will have any to supply. Roughly speaking, 300,000 troops are thus at present in the pay of the native States of India, and two-thirds of this number are concentrated under the rules of ten Princes. Since the last Indian scare some attention has been paid to these troops as a line of defence, and every year is likely to see more and more heed and care paid to them by the English Raj. Their cavalry even now is probably by no means inferior to that of many of the Cossack sotnias; with English supervision it will quickly improve: are these troops then to be launched against the Cossack brigades, armed with a proper force of Cossack horse artillery? Or if they are to be combined with our own cavalry, thus more than doubling its numbers, are the auxiliary horse artillery to be left at

¹ Should have been Field Army.—ED.

its low strength of eleven batteries at peace establishment? The very fact that such irregular cavalry is likely to prove for all but reconnaissance work inferior to the mounted troops of European Powers, is an argument for giving them an extra large proportion of guns, rather than none at all.

In conclusion, I should like to say a few words about the cost of horse artillery, as many people look upon it as out of all proportion to its usefulness, others, though admitting its utility, would maintain it on as low a scale as possible for reason of this expense.

The principal items of expenditure over a field battery are as far as I can gather as follows, though it is possible I may have overlooked some items:—

	Higher establishment.	Lower establishment.
Difference in pay between a H.A. battery and a field battery, as set forth in the Army Estimates for the current year.....	£ 558	£ 924
Extra rations for men (viz., 151 men instead of 150, and 115 instead of 100) at 10 <i>l.</i>	10	150
Difference in money between the clothing of a H.A. battery and a field battery	99	84
Forage for 29 and 38 horses calculated at 2 <i>l.</i> per horse per annum	841	1,102
Total annual charge	1,508	2,260
Add for depreciation of stores and extra horses : 29 horses minus 11 officers' horses at 3 <i>l.</i> per annum, and 38 minus 11, <i>i.e.</i> , 18 and 27 horses	54	81
One seventh of the cost of the extra saddlery....	18	26
Making a total per annum per battery of	1,580	2,367

But it must be observed that even this comparatively small extra cost is, in reality, less than it appears, for I have taken the lowest establishment of a field battery, when the amounts include respectively one man and fifteen men extra, hardly a fair item to enter into the comparison.

Was it for sake of this sum that four good old batteries were lately reduced? Surely it would be wise to raise them again, if I am right in the figures I have brought forward, and which merit a short explanation.

The first item includes the Officers' pay: thus, in it is included the 2*s.* 6*d.* a-day horse artillery pay the Major receives, or 45*l.* a-year; out of this he has to pay 1*l.* for income tax and 4*l.* 10*s.* for shoeing his horses. The remainder, 39*l.* odd, is supposed to provide for maintaining him in saddlery, stable necessaries, and horses. It is doubtful if the State would gain in relieving him of this. The main

part of the third item is made up by providing the dismounted men of the field battery with a mounted kit ; the extra charge to the State of a rank and file horse artilleryman over that of a field battery mounted man is but 6s. 11d. annually. To speak of the expensive horse gunner is therefore a mistake, his dress actually costs 4s. 3d. less than that of a hussar, and 1s. 2d. less than a foot guardsman.

And yet it was not long since that we were told "the pomp of horse artillery, with its smartness and rapidity of pace on parade, cannot but cause regret at seeing its numbers reduced, but an undue proportion of it is an extravagance from every point of view that cannot reasonably be defended ; and, if by the economy effected by the conversion of three horse artillery batteries into field batteries we can add to the fighting value of our Army as a military machine, we ought not to hesitate to do so."

I humbly maintain if we had hesitated longer we should never have taken the step.

The CHAIRMAN : I feel I shall express the wish of everyone present when I tender, in your name and in my name, our best thanks to Captain Robertson for the lecture so ably carried through, worked up with such care, and showing, as he has done before, such deep interest in his profession. We must all feel that this is a subject of vital importance to the efficiency of the Army, and therefore of the deepest interest to every intelligent man in the kingdom. I now beg to invite, according to custom, any gentlemen to make remarks in discussion upon this subject.

Major BARRINGTON FOOTE, R.A. : Rather from the point of question than of discussion I would ask to say a few words. There are several instances of rapidity of movement and the mobility of artillery generally quoted, and these usually come from India. The instances here are somewhat old, and I should like to quote an instance which took place about a year and a half ago, when Major George Turnbull's battery, out in India, covered in a certain march 47 miles in 10 hours and 10 minutes, which is even more rapid than many of the instances given here. I should be very glad to know whether there is any record of the mobility of artillery in England, or whether any record shows that mobility is recognized as one of the main points in the practical part of artillery training. Of course I am aware that a gallop of from 200 to 300 yards sometimes takes place at such places as Woolwich Common and elsewhere, but are there any records of more real training kept as to its being a *custom*, or any as to the tactical efficiency of batteries after long and rapid movement ? These short manœuvres may cause enthusiasm amongst the spectators but they can scarcely be considered *la guerre*. The only other question I would ask for information is with reference to the reduction of horse artillery which took place some time ago, and it occurred to me it would be possible to meet the question of expense by maintaining the original number of batteries, but with reduced detachments. In my humble opinion, though I am perfectly sure I stand in a minority in what I am about to say, in time of peace it would be well perhaps to have considered this reduction of detachments. A horse artillery gunner need not be a brilliant horseman. The accomplishments of the riding school and the intricacies of the *manège* are, to my mind, quite beyond the necessity for a horse gunner.¹ The gunners of any field battery would in a short time be able to sit on

¹ The horse gunner works as one of the detachment in a battery, rarely is he required to act independently. The whole battery is one machine ; never less than two guns with all that belongs to them would be alone. The cavalry soldier requires far more skill and higher class horsemanship. He constantly has to move and act independently, and, further, one of his chief duties is to be able to fight *on his horse*.—F. O. B. F.

a horse sufficiently well for all practical purposes. The horse artilleryman's horse is not a means for him to fight on, it is simply a means of locomotion, to fight when he gets off it to serve his gun, very much on the principle that horses or camels or carts are used for mobile infantry, simply that that arm may be carried rapidly to any required spot, their actual fighting power only coming into play when they arrive there.

Major DAVIDSON, R.A. : There was one thing in reading over this paper which struck me as being rather startling, and as Captain Robertson repeated it in his lecture I think it requires a little explanation. He says: "And though cavalry actions are proverbially soon over, yet, allowing an interval of 6 seconds per round, in less than 3½ minutes the whole of your limber boxes will be empty." Does that allude to the whole of the battery limber boxes or does each gun fire a round a-piece in 6 seconds, because the lecturer also says with reference to a battery charged by cavalry, "When he is 400 yards from the guns they cease firing on the leading line, having been able during the 2 minutes 40 seconds of its advance to fire 18 rounds of shrapnel or 24 of common," that is, only 50 seconds less than 3½ minutes. Surely it must allude to only 36 rounds for the whole battery, and therefore there would be 180 rounds still left. It is rather alarming if the whole of the limber boxes would be emptied in 3½ minutes, and I cannot help thinking it must be a mistake. With regard to Major Barrington Foote's remarks about mounting the field artillery gunners without riding lessons, there are many Officers present more qualified to give an opinion on this subject than myself; but I think we have all seen gunners in positions where horsemanship was very requisite indeed; in fact, if the field artillery gunners started on the animal with a view to locomotion only, it would be quite possible that the animal and he might differ so much as to the direction the locomotion should be in, as to prevent any combined result.

Captain ROBERTSON : With respect to Major Barrington Foote's remark, I can only answer for myself, that I have taken the illustrations rather largely from India because I have not found them at home. I have carried out a long march myself in India but it did not meet with approval. I certainly would not like to try one at home. With regard with Major Davidson's remarks, what I meant was this, that in the case of cavalry advancing against artillery I was not supposing you are going to lose your head and fire as many rounds as hard as you can. I was simply stating what I thought was a fair rate of deliberate firing for preventing them approaching. In the other case I wanted to illustrate that if you did lose your head and your men lost their heads and there was no fire discipline, the very shortest amount of space that you could fire away the whole 36 rounds from your six guns, every gun firing away as hard as it could. I was not at all advocating such a thing; I very greatly deprecate it; but men do lose their heads, and I wished to point out if such things may occur it is all the more necessary to have your wagons fairly near.

The CHAIRMAN : I would ask permission to say a few words. I can only venture to address you as a cavalry soldier, which I have been all my life, but all my life I have had a strong opinion that horse artillery and cavalry should go hand-in-hand. One without the other is of but little value. I have tried in India, at the Curragh Camp, and elsewhere, whenever I have had the chance, to practise the exercises of these branches of the Service. Unfortunately for us, we have very few fields for this purpose, except the grand field of India, and the opportunities are very rare. Even the Long Valley at Aldershot is too small for a small brigade of artillery and cavalry. So it is, and we must not lose sight of it. It is serious to know, and many of us have seen it, that often good commanders in the field are at a loss what to do with their cavalry and horse artillery merely for want of practice. Looking to the future, we are all very earnest in the hope that the horse artillery will be re-established, and to the best of my small ability I have tried for the last two years in the House of Commons to support this idea. I have done this without reference at all to politics, and I merely mention it to show that I am a friend to the horse artillery through the cavalry interest, and I shall work for this end in the future as staunchly as I have worked in the past. I, to-day, came to England on purpose to be present, and to have the honour of presiding at this lecture, and this morning, with other things to do, I did take a few notes, and if you will permit

me I will explain them. I will not trespass on your time by expatiating on the splendid work the horse artillery has performed in the old days; we all know it, the country knows it well. In these days of what they call progress, but some of us think them changes, modern instances only are supposed to have effect. Fortunately, we have modern instances proclaimed conspicuously by that great commander who has been so highly spoken of to-day, and whose letters find such favour in all soldiers' hearts—Prince Kraft zu Hohenlohe. His writings have fortunately been translated into English, and I trust that the translation will be a text-book to every soldier in every rank in every branch of our profession. I will not go into the stories of long marches, of the splendid mobility and of the power of concentrating masses of artillery to pour fire into an enemy and of its grand effect; but I should like to refer to what he tells us so continuously of the splendid power of horse artillery in pushing to the front as compared with field artillery. We give all honour to field artillery, but it is impossible that they can do the same work as horse artillery. Their ground-work is of a different character. We have this recognized in Lord Wolseley's "Pocket Book," and I have written down his very words; he says: "It must be remembered that batteries of field artillery are not supposed to move faster than a walk as the gunners march on foot." Therefore, how is it possible that field artillery can get forward in the way that Prince Kraft has claimed for horse artillery? We all claim that batteries, whether in India or at home, do push to the front. I have always thought—"every man to his last"—our field artillery are splendid, our infantry are splendid, our cavalry, we believe, are splendid, but let us give credit to those who deserve it and who have the power of pushing forward. In parentheses I might say in answer to Major Barrington Foote's remark, that we did put it forward at the time of the first reduction of horse artillery, and we had excellent advice about it before we put it forward, with regard to making certain reductions in the horse artillery batteries, so as to save the battery cadres. That went before those who certainly seemed to be opponents to horse artillery and it was not accepted. We tried that two years ago, but it would not do at all. Our gallant lecturer speaks of the rôle of cavalry, covering the front, that is what we have been brought up to. We have seen it very conspicuously carried out in the late wars and we certainly shall have it in the future. I remember some very hot work we had in the House of Commons, perhaps not very strongly reported, as the reporters do not take as deep interest in the horse artillery as we wish they did; but I remember a member of the Irish Nationalist Party, as it is called, spoke to the point very much: he said he had served in the French Army during the war with Prussia, and on account of the horse artillery and cavalry the infantry never had a moment's rest, they were always hurried. And so it must be, and how can we possibly cover the front with cavalry unless we have horse artillery to help us? I need hardly touch on the question of proportion. Field-Marshal Lord Napier of Magdala in the House of Lords two years back entered into the question and held a strong position with regard to it. We have heard to-day no word of challenge as to the proportion of horse artillery to our Army. A certain paper came out a few weeks ago, and one or two who knew the work well and one or two who did not know it entered into it and they could not agree. I am sorry it is not challenged here to-day. I will only remark it occurs to me that there is much that is ignored. I will leave it to the future and I trust that this will be cleared up. I do not think anything can clear it up except an open discussion about it, and I do consider that our splendid cavalry in India, regiments of which I have had the honour of commanding in brigade with the native regiments in Her Majesty's Service (we always put two of them to one of our regiments), surely they are to be taken account of in the proportion of cavalry requiring horse artillery! If not, why keep them, with all their splendid services? I would say only a word or two in conclusion. I have touched much on the evidence of Officers in the highest position in foreign armies who have had opportunities of really going into great campaigns, but I would not for a moment ignore the evidence of those that we have served under and that we believe in. I have in my hand a packet of most interesting letters from Officers of the highest rank in the Service and from most distinguished Commanders, all deprecating deeply the reduction of horse artillery. I will not trouble you with more; but I do trust that we shall work with all our energy and with all our zeal, so that the

words of His Royal Highness the Commander-in-Chief shall be carried out when he said: "I consider that it should be restored to its former strength." He was speaking of the Royal Horse Artillery before Lord Randolph Churchill's Committee. These letters in my hand speak of the past—of the great work that the horse artillery has done, and how it has turned the tide of battle. These letters also clearly prophesy, by men who know no panic and who have every belief in the English Army; still they prophesy that if we go out to campaigns as our Army often has done before, we shall most certainly suffer unless we have our proper strength of horse artillery and means of supply. His Royal Highness has told us that he does not believe in reserve men after a year, and the Secretary of State for War, in answer to a question of mine lately, admitted that he had been obliged to send men from the 1st Army Corps to supply the common necessities of horse artillery for the year in India. Unless we have a proper supply always ready to go with a proper force in proportion to the Army (not in proportion to the cadres of cavalry regiments) of well trained artillerymen and horses (if you take from Leicestershire the finest horsemen and the finest horses, you will not train them to work in a horse artillery gun in time for any campaign), I say unless we have them beforehand these letters foretell clearly that we must expect to meet with a disaster that no strategy can retrieve, no sacrifice can save, and no courage can avert.

THE NAIL-LESS HORSE SHOE.

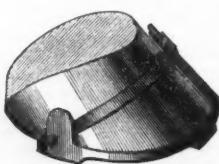
SPECIMENS of these shoes were shown at the meeting on the 3rd May, when the following were brought forward as prominent features of the shoe, viz. :—

1. No nails or screws in the hoof, and consequently no damage to the foot from carelessness or accident in shoeing.
2. No undue compression to any part of the foot or to the walls of the hoof.
3. The bite or grip of the attachment is firm and secure. It can be tightened or loosened at will, and readily accommodates itself to the exact tightness with which the shoe is required to be affixed.
4. It can be taken off at any moment and replaced in a few seconds.
5. It can be made to any size and form of foot.
6. It will not interfere with the action of the horse.
7. It will act as a support to the hoof and will tend to prevent sandcracks.

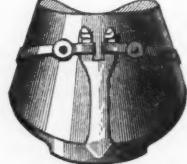
The shoes were inspected by many of the members, but there was no discussion as to the value or otherwise of the invention.

The shoes can be seen in use in London on application to the Secretary of the Adjustable Horse Shoe Company.

Side view.



Front view.



Hoofs shod with the nail-less horse shoe, showing the attachable parts in position. These may be attached or detached with the greatest ease, in a fraction of a minute, but, it was stated, cannot be removed accidentally.

Wednesday, May 8, 1889.

GENERAL SIR C. P. BEAUCHAMP WALKER, K.C.B.,
Vice-President, in the Chair.

LANCERS AND LANCES.

By Lieutenant-Colonel R. ELIAS, h.p., late East Lancashire Regiment.

FOR some time past there has been a very strong tendency in the German, French, and other Continental armies against encumbering cavalry men with cuirasses, and in favour of arming a large proportion of them with lances. The cuirasses have very few friends, but the lances have a great many, and I think I may say an increasing number.

A very few words need be said about cuirasses; in fact they only belong to the question as having shown a tendency to vanish in proportion as the lances have risen in favour, and in some cases old cuirassiers have become new lancers.

After the Crimean War, Russia had abolished her eight regiments of cuirassiers; she has, however, since re-established a Division of them—four regiments of the Guard.

After the war of 1866, Austria abolished her twelve regiments of cuirassiers, and transformed them into dragoons.

On the opinion of a Commission, presided over by General Lehn-dorff, and after some experiments made against cuirasses with firearms of small calibre, the Germans suppressed the cuirass in 1888, only last year. Thus, while the great military Powers of Europe are either totally or nearly abolishing cavalry equipped with cuirasses, an idea in another direction is leading to a very large and general increase in the number of their lancer regiments; and in France, where lances were altogether abolished shortly after the 1870 war, they are now trying them again.

Austria is now the only country possessing no lancers; but it is possible that there also they may shortly be recalled to life.

Germany has been the leader in the present movement in favour of lances; and not long ago—only last autumn—it was decided there to arm with that weapon some of the regiments just deprived of the cuirass, and this is supposed to be only the prelude to a more general measure.

In an article entitled "Cuirassiers et Lanciers," in the *Revue Militaire de l'Étranger* (30th August, 1888), the author endeavours to

trace the ideas which have led to the reorganization of cavalry now being carried out in the German Army. He says:—

“A study of the growth of opinion which has led, and is still leading certain countries, particularly Germany, to put so much faith in the lance will not be devoid of interest.

“We shall no doubt find in the course of this research a confirmation of the fact that the traditions of the wars of the early part of this century, which the Germans have studied so thoroughly, have considerably influenced the important modifications they are now making in their military organization.

“The power of a weapon as a tactical instrument is not to be gauged only by its material properties; its power increases with the confidence it inspires in him who uses it, and the terror it strikes into those threatened by it. This is the moral value of the arm. A sentimental idea, perhaps, but nevertheless not without practical effect. Thus in the last war all the German cavalry was used indiscriminately, hussars and dragoons going out on reconnaissance duty as well as uhlans; yet it is only of these last we hear. Men created the legend of the uhlans.

“The perusal of the principal studies on cavalry, written in Germany, enables us to throw the light of a particularly interesting epoch upon the doctrines of this arm.

“The very decided opinion of our neighbours on its employment is not derived only from the work of the last few years; it is the result of long-continued labour, begun immediately after Sadowa and scarcely finished to-day.

“The Germans have believed in evolution, but never in any diminution, in the tactical power of cavalry. To-day, as much as ever, Frederick and Napoleon are the sources incessantly explored, and are *the most modern masters recommended for the meditation of German cavalry.*”

As small arms improve, their effect upon the moral condition of the infantry is enormously increased. Now-a-days infantry is much more exposed than formerly to the disintegrating effects of fire. The course of the combat alone entails great physical exertion, and this fact should be thrown into the balance in favour of the action of cavalry when we compare modern battles with those of former times.

Again, in admitting the continuous improvement in firearms, we must also credit them with a demoralizing effect, a power of wear and tear so great that certain portions of the fighting line, having been specially under their influence, will be found helplessly at the mercy of a daring cavalry capable of seizing the happy moment.

“If cavalry,” says the author of “The Cavalry Division in Battle,” “would only realize the enormous destruction of infantry in a fight with firearms, if it were acquainted with the ABC of infantry tactics, and especially if all our cavalry had been able to see the state in which discomfited infantry retires, it would never allow it to be said that the action of cavalry in battle is only accessory.”

This absolute conviction concerning the rôle of cavalry in battle will be found in nearly all the works of German military writers;

and let it not be thought that such doctrines are professed only by cavalry leaders; many infantry men are of the same opinion.

“ . . . Against inferior or broken infantry, cavalry is *just as powerful now as ever*. Infantry which is not very solid loses its head just as easily as of old on the appearance of masses of cavalry swooping down on it at full speed; and if at that moment the men, instead of firing with cool judgment, let off their guns in the air and seek safety in flight, it is a matter of indifference whether their arms can carry 200 or 1,500 yards, or whether they can fire 4 or 10 cartridges in a minute.”

Having conceived a clear idea of the rôle of cavalry in future operations, and broadly defined its place in the great battle drama, the Germans have been at the pains to assign to it such an armament as will enable it rigorously to carry out their ideas; and they have not forgotten that their cavalry must be impressed by the conviction of its own thorough efficiency for the performance of its strategical and tactical duties.

The objects aimed at are—to possess a maximum of power both moral and material on the field of battle, and to be in a condition to act strategically in front of an army without the aid of infantry. For this two-fold reason Germany has increased the number of her lancer regiments, and provided all her cavalry with carbines.

Feeling, as they do, quite certain that the tactical value of cavalry is modified but not diminished, the Germans have not feared to adopt the ideas of Marshal Marmont although half a century old, and to agree with him that “for cavalry of the *line* the lance should be the chief, and the sabre an auxiliary weapon.”

It is not without reason that the Germans, who have such a special predilection for sabre cuts, are now developing the use of the lance; moreover, they were astonished to see the French, who with good reason hold “the point” in great esteem, abandoning the lance, which is *par excellence* the thrusting weapon.

Colonel Brix, of the German General Staff, in an interesting study on cavalry armament,¹ recognizes this tendency of Northern peoples to cut rather than to thrust, and goes so far as to regret that the German soldiers should possess a cutting weapon; and after narrowing the question down to a choice between the straight sword and the lance, he pronounces decidedly in favour of the lance.

A writer in the *Militär Wochenblatt* is of opinion that in a charge in line, or in a charge against batteries, the sabre cannot replace the lance. But his mind is evidently possessed by the success of Stuart, Lee, &c.; he remembers the sanguinary charges of the War of Secession, executed revolver in hand. Also, without unduly upholding a method of combat as dangerous to one's self as to the enemy, and above all very apt to counteract all the intensity of the shock, he considers the revolver to be the special weapon of individual combat; and he comes to the conclusion that the cavalryman should be armed with a carbine, a lance, a revolver, and in addition with a light sabre,

¹ “Thoughts on the Organization, Training, and Employment of Cavalry in Modern Warfare.”

which he says will make scarcely any appreciable difference in the weight. This is the armament of the Italian cavalry, who, I may mention, have the sword attached to the saddle—not to the rider.

Colonel Brix, having admitted the superiority of the lance, proceeds to certain more minute criticisms. Although everyone agrees that the duration of a cavalry combat against cavalry with the *arme blanche* is extremely short, and that after the shock or meeting there are very few "points" given, this Officer, considering the very special case of the *mélée*, tries to fix the dimensions of which the lance should be so as to make it as effective as possible. "The long lance of 9 or 10 feet," he says, "is unsuitable for the *mélée*." Perhaps the best length for a lance would be 2 metres, which should be held as near the butt as possible, so as to make it as long in reach as the ordinary lance held in the ordinary manner. In the *mélée*, or in single combat, it would be held in the middle; it would then become a description of lance no longer than a sword, and as easily wielded, and which with its longer reach would be more effective. Colonel Brix thought that besides this lance the cavalryman should have a light sword.

The German cavalry is deeply impressed with the idea that the lance is the true weapon for the battlefield. The Russians have shown that they share this conviction by giving this arm to the front rank of their regiments of cuirassiers, uhlans, and hussars.

Opinions as to the numerical proportion of lances to other weapons, and as to their distribution in a squadron, regiment, or brigade, as the case may be, differ very considerably. The *Rivista Militare*, in an article on cavalry organization, sharply criticizes the distribution of different weapons in the same squadron. "There is no unity," says the author, "when men with lances and others with guns ride in the same squadron; but with a regiment of lancers and a regiment armed with carbines in the same brigade, then the true unit is the brigade."

Without enumerating historical examples, which would unduly extend the sphere of this study, we may nevertheless call to mind that the success of the charge made by the 3rd Regiment of Uhlans of the Prussian Guard on the Austrian uhlans regiment "Empereur du Mexique" at Czerwenahora (27th June, 1866) was attributed by many German Officers to the fact that the Germans had much longer lances than the Austrians.

The remarkable success gained by Captain Bechtoldsheim, charging at the head of three troops of Sicilian uhlans at Montecricol (Custoza), has been also by many military writers attributed to the lance.

I am here reminded of another feat of arms in which tradition has awarded victory to the lance—I mean the celebrated charge at the Pass of Somosierra, from which the Spaniards were driven in 1808 by Napoleon's Polish Cavalry of the Guard charging up the causeway right into the jaws of a Spanish battery, posted in what was supposed to be an impregnable position. Well, unfortunately for tradition, these gallant horsemen were not armed with lances at all at the time, but with swords—and it was not until the following year 1809 that

they received lances, and became, what we now generally call them, "Polish Lancers." Still, we are free to maintain that if they had had lances at Somosieira, they would have performed just as well—perhaps, even a little better.

In Germany the necessity of giving to the cavalry the support of a firearm being considered undeniable, they have only to choose between two means, *viz.* : (1) associating with cavalry, bodies of infantry, mounted or conveyed on wheels; and (2) providing the cavalry with firearms. They have chosen without hesitation the latter method; hence abolition of the cuirasses. They also find it advisable to provide that half of the cavalry which is the heaviest and most powerful in the shock, with the lance, the tactical arm *par excellence*.

Germany then will soon possess only two descriptions of cavalry, *viz.*, cavalry of the line, powerfully mounted, and armed for the charge in line, *i.e.*, the cuirassiers and uhlans; and the light cavalry, more alert for fighting on foot and better equipped for individual combat, *i.e.*, the dragoons and hussars. Carbineers, light horse, &c., as far as concerns organization, will be no more than historical varieties of the above two categories.

There is nothing new in the application of similar ideas to cavalry organization; their origin is to be found in the wars of Napoleon.

In a letter to General Clarke, Minister of War (12th August, 1811), Napoleon writes as follows on this double question of cuirassiers and lancers: "It is admitted that cavalry in cuirasses cannot easily use a carbine; but it is nevertheless very absurd for three or four thousand brave men to be surprised in their cantonments or stopped on their march by a couple of companies of light infantry. . . . I desire that you form a council of cavalry Officers, and come to some conclusion on the subject. I cannot accustom myself to see 3,000 picked troops made prisoners perhaps by the light troops of some partisan leader in an insurrection or a surprise; or, on a march, pulled up by a few wretched pot-shots behind a stream or a house; this is absurd; my intention is to give every man a firearm.

"War is made up of unexpected events; and he has no notion of it who supposes that 15,000 heavy cavalrymen can always make sure of some escort or cover.

"As to the lancers, see if it is possible to give them a carbine in addition to the lance.

" . . . The Cossacks have lances, but they have carbines, and even long muskets, with which they shoot at very long ranges."

That is the programme now being partly carried out by the Germans in their cavalry reorganization.

Without going back (remarks the *R. M.*) to the days of chivalry and feudal times we may be permitted to ask: Is not the lance the very weapon most suitable for the heavy cavalry, acting, as they do, more than any other arm by shock?

The Germans had up till lately twenty-five regiments of uhlans, *i.e.*, armed with lances. When the present organization is completed, these regiments will number thirty-five: or even thirty-nine, if the measure

be applied to the four regiments of Saxon and Bavarian heavy cavalry.

Germany has apparently, says this French Officer, once again turned for inspiration to our military past.

II.

The following is translated from the *Militär Wochenblatt* of the 16th January, 1889.

The writer, after remarking that the recent manœuvres at Müncheberg (autumn of 1888) brought out many points of interest with regard to cavalry, continues:—

"I have only to mention the word 'lance.' There can be no doubt that the ideal cavalryman for the fight would be a perfectly trained, well-mounted, and skilful horseman, armed with lance and carbine. We shall see after a fair trial now being made in certain regiments furnished by way of experiment with lances whether this ideal is attainable. . . . That the lance is a disadvantage when cavalry are fighting on foot, detracting from the free use of the carbine, is, I think, undeniable; but the most important consideration appears to be that we should possess the lightest possibly equipped horseman, able to slip through or over anything, for long distance reconnaissance rides and operations in difficult country. One can hardly imagine a 'Zieten out of the bush' armed with a lance—practice, however, accomplishes much, and whoever has served with both uhlans and light regiments can say whether the former were as 'handy fellows' as the latter. Unquestionably a patrol of uhlans can move about a country patrolled by the enemy with more confidence than horsemen armed only with sabres, which is another advantage as regards reconnoitring duty. A certain feeling of superiority and independence is doubtless pretty general among uhlans. There are so many points for and against each side, and they are so evenly balanced, that it is impossible to exhaust them. . . .

"I do not think the lance question will be settled during the year 1889, as our custom is to prove things thoroughly."

III.

In Lieut.-Colonel Denison's "Modern Cavalry" and "History of Cavalry" there are many examples of cavalry fights in America (War of Secession) and elsewhere, also many opinions on cavalry armament. He quotes, like many others, Montecuculi's well-known saying that "the lance is the queen of weapons," and appears to agree with it to a great extent. "The lance is a most efficient weapon," he writes, "when used by a thoroughly trained man; but in the hands of new levies it is perfectly worthless. In carefully disciplined cavalry of the line intended for charging alone, the lance has a terrible moral effect upon the enemy. . . . When the fight, however, degenerates into the *mélée* then the lance is awkward and cumbersome."

¹ *I.e.*, a dash of cavalry from behind covert, after the manner of Zieten.

Colonel Denison frequently points to the extraordinarily small amount of damage done on either side with any *arme blanche* compared especially with the deadly effect of the revolver, which ranks very high in his opinion as a cavalry weapon, against cavalry, or against anything except long-range firearms.

Quoting General Stephen D. Lee (War of Secession) he says: "My experience was that the cavalryman was timid with his sabre in fighting against the revolver, and for the least excuse will drop the sabre for the revolver. . . . I don't see well how the sword can be dispensed with permanently, as some such weapon is required in case ammunition should be exhausted; but if any weapon is to be dispensed with, I should say the sabre in preference to the rifle or revolver. In every instance under my observation, the revolver replaced the sabre with the *morale*, with the troops, and against the enemy. . . . Lancers should always have swords as well as lances, as they never dismount to fight, and the swords are therefore not in the way."

Colonel Denison gives his opinion that heavy cavalry should be armed with lance, sabre, and revolver; one-half of them, or a somewhat similar proportion, being armed with sabres and revolvers alone, and the remainder with lances in addition. He also calls attention to that phase of the Franco-German War when, early in the Siege of Paris, the French had organized the "Francs-tireurs." "When these Francs-tireurs became numerous, the uhlans could no longer move freely to great distances, but were almost always accompanied by battalions of infantry. . . . The experience of the Franco-German War is very remarkable on this point, for the brilliant exploits of the Prussian cavalry in the beginning of the campaign would lead one to expect that they would not have been much embarrassed by the opposition of such undisciplined and irregular troops." This, it will be noticed, is exactly what Napoleon I wrote about in his letter to General Clarke quoted above. In the War in America, the Southern horse were somewhat surprised at meeting with the same difficulty.

IV.

The late Major-General Sir Charles Macgregor¹ writes: "With regard to the armament of native cavalry, I consider the sword to be the queen of weapons for the light horseman . . ." And he proceeds to advocate, in addition, a carbine, or a double-barrelled pistol, for each man. He then says: "I am of opinion that the lance in the hands of a master in its use is the most deadly of all weapons; but I know from experience it is so difficult to learn the use of, that I would not venture to recommend its general adoption in any regiment of cavalry. On the other hand, I would not wholly abolish it, for in Indian warfare there are times when a few skilful lancers can be of the greatest service. The only drawback to having an unfixed number of lances in a regiment would be their appearance

¹ "Life and Opinions of Major-General Sir C. MacGregor," vol. i, p. 209.

on parade; but, while I think that appearance should on all occasions be sacrificed to utility, I think that a little management might so place these lances as not to offend the eye of the most particular."

V.

In France, by a recent order, the *front rank* of ten (or twelve) regiments of dragoons, forming part of the "independent cavalry," have been experimentally armed with lances. On this, a French military publication (*Revue du Cercle Militaire*) remarks that it is a measure which can hardly astonish cavalry Officers, but, on the contrary, must appear to them very tardy. We naturally ask what were the circumstances which led to the disappearance of the lance in the French Army. It appears that after the War of 1870-71, when it became necessary to reorganize the military forces, the first step taken relative to cavalry was to abolish the lance; and, by a Ministerial decision in August, 1871, nine regiments of lancers were dispersed, and incorporated into other branches of cavalry—hussars, chasseurs, dragoons. The principal cause of the abolition of lances is to be attributed to certain not very well-reasoned ideas springing from the moral depression caused by the disasters of 1870-71. In the state of mind thus induced, the French seem to have exaggerated the effect of modern arms of precision on the *rôle* of cavalry, and to have overlooked the fact that its shortcomings in the late campaign were greatly, if not chiefly, due to want of skill in the higher ranks, to a certain unreadiness for war which pervaded the whole army, and to a too faithful adherence to antiquated regulations and formations. Even before the war was over, distrust in the lance, and in the *arme blanche* generally, had become pretty widespread. A French Colonel of lancers is reported to have requested the Ministry to take away his lances, and to give him chassepôts instead, adding that armed as he was, he could not efficiently reconnoitre, and "enlighten" (*éclairer*) the army. But the authorities, in reply, pointed to the Prussian uhlans as an example of men armed in the same manner, and having become specially notable for reconnaissance services; and it is a very curious instance of the inconsequence of public opinion that, just at the time when the French lancers were being abolished, the renown of the legendary Prussian uhlans had become exaggerated almost to the point of mythology. The writer in the *Cercle Militaire*, expressing no doubt the general opinion of French cavalry Officers, cordially welcomes the return of the lance; he enumerates its many advantages over other cavalry weapons—its great moral effect, its length of reach, not only offensively, but also in keeping off assailants in front, on either hand, and even from behind, not forgetting the great effect of a dexterous and timely blow with the butt-end—and quotes Marmont and others in support of his opinions.

We mentioned above that the newly-armed French regiments are to have lances in the front rank only. Marmont, in his "Esprit des Institutions Militaires," has the same idea. "The cavalry of the line," he says, "should have lances and straight swords; the front rank to

charge with the lance, the second rank with the sabre—once the shock has taken effect and the ranks become mixed the swords of the second rank will perform their office." The Russians have the same arrangement, maintaining that after the first contact of two bodies of cavalry charging, the lance, even for the front rank, becomes almost useless, and still more so for the rear rank. So that the rear rank must have swords with which they can back up their front rank men. The principle is the lance for the shock and the sabre for the *mélée*.

VI.

As nearly all the writers whose opinions I have seen on this question are in favour of lances, it is only fair to notice one or two who are less favourable. First, a French Officer in the *Revue Militaire de l'Etranger* (1st March, 1889) breathes forth a note of warning tipped with railery. He begins by assuming that the new French lancers are to be armed with the lance alone, and calls the whole movement a mere sentiment and a tendency to copy "our neighbours" (*i.e.*, the Germans); he calls the lance a weapon of antiquity and of the middle ages, and the present re-institution of it in France an ill-starred experiment (*essai malencontreux*). This would be all very well if it were intended that the lancers should have nothing but their lances to depend upon, which will assuredly not be the case. I have not yet heard what the whole armament of the French lancer is to be, but certainly he will not be armed with the lance alone, probably with a long-range carbine in addition. The reasoning of this author is logical in appearance, but it does not embrace the whole question; it is all based on the idea that a lance is better than a sword, because it reaches further; and a long-range firearm better than either, because it reaches further still. But, as we have seen, there are occasions when swords and lances can be used with very great advantage.

There is also the late Captain Nolan, 15th Hussars, who wrote a book on cavalry, and in it does not express any special enthusiasm for the lance—rather the reverse. He admits that on certain occasions it is useful: for instance, against young and inexperienced troops, who are frightened at its formidable appearance, and also at the first onset when there is plenty of pace on, for with speed you can drive a lance through anything; but without it, it is very difficult to make it penetrate. He reminds us that when the 16th Lancers broke into the Sikh squares at Aliwal many of the lancers were laid low by the Sikh swordsmen in the *mélée* which ensued, because they were then unable to use their lances. He also states that the pennons are seen a long way off, that they attract the fire of the artillery; and sometimes frighten the adversary's horse, making him shy and get out of reach just as our brave lancer is making his point. But any objection to pennons can surely be easily remedied—they can be taken off. Captain Nolan thought the lance a better weapon than the ordinary European cavalry sword; but not so good as the scimitar of a Turk, the sword of a Mahratta, Sikh, or Circassian horsemen, or any sword with an edge to it.

VII.

To sum up, three chief points have to be taken into consideration: (1) cavalry against cavalry in line, or large bodies in battle; (2) cavalry acting independently on reconnaissance duty, &c.; and (3) cavalry against infantry and gun detachments (excluding, however, fresh infantry armed with the best modern rifles, as being invulnerable by and inaccessible to cavalry).

As to (1), cavalry in battle. In the Franco-German War the different kinds of cavalry on both sides were frequently employed together and indiscriminately, cuirassiers, lancers, hussars, chasseurs, all mixed together. This was the case on *the great cavalry day*, the 16th August, at Vionville and Mars-la-Tour; and although, on account of many disturbing influences, little light is thrown on the use of any particular weapon in these encounters, we may, I think, assume that for such charges, lancers should have a sword and perhaps a revolver. In the American War of Secession the revolver did much greater execution than either lance or sword. The revolver, however, as at present constituted, is rather a tricky weapon, occasionally dangerous to one's self and friends. Time, however, will probably remedy this drawback. (2.) Cavalry employed independently, *i.e.*, the uhlans, found lances admirable weapons in 1870-71; but they must have a long-range firearm in addition, as we have seen, or be accompanied by comrades who have. (3.) Against more or less shaken infantry, gun detachments, &c., all admit that lances are very effective, but even here the addition of a sword or revolver would be advisable. It will thus probably be agreed that lancers should, besides their lances, have revolvers or swords, or both (the sword perhaps attached to the saddle), also a long-range firearm; and a choice must be made between providing each man with three or four weapons, and fixing a unit, be it squadron, regiment, or brigade, composed of men not all armed alike, but furnishing all the weapons in the aggregate. The plan of having lances in the front rank only appears to me well worthy of consideration.

For us who so frequently have to fight with people such as Afghans, Arabs, and other Asiatic warriors, very brave, but always badly off for firearms, and often proving specially dangerous by unexpectedly delivering sword cuts when lying on the ground, lances are of the very greatest service, as a cavalry man with a sword cannot reach them.

VIII.

With regard to the weapon itself, lances have been made of many different patterns, sizes, and materials. Formerly the shafts were usually made of ash, but bamboo is now the favourite, what in India is called male bamboo, *i.e.*, the solid and heavier kind. In India bamboos are grown especially for lance shafts. The head is fixed on with shellac. Unless they are very well made, the part where the head is joined on to the shaft is a weak point in lances. It is said that this weakness was one of the reasons for the abolition of the

lance in France and Austria. In order to escape the necessity of this joint, some lances have been made entirely of metal; one pattern had a screw in the middle so that it could be taken in two. But the metal lances were heavy, and such experiments do not appear as yet to have met with much success. The Germans, French, and Russians are all favourable to the bamboo shaft. The French, I believe, expect to get theirs from Tonquin. A very well-known sword and lance manufacturer here in London informs me that he has had enquiries addressed to him by Germans and by Russians about bamboo shafts for their lances; but at present it appears that the supply of male bamboos is inadequate even for our own Army.

I hope I should not be thought unpractical if, in conclusion, I were to invite attention to that splendid charge of lancers in the "Lay of the Last Minstrel," where the Lord of Branksome, with 500 riders, goes out to meet Gilbert the Galliard at the head of the Beattison clan, when he wound his horn

"So loud and clear
In the grey mountain mist there did lances appear.

Then had you seen a gallant shock,
When saddles were emptied and lances broke!
For each scornful word the Galliard had said
A Beattison on the field was laid.
His own good sword the chieftain drew,
And he bore the Galliard through and through."

The CHAIRMAN: I hope there are some, I might say many here, who will join in the discussion on this very interesting lecture, which gives large scope for consideration. I will particularly request the opinions, which will be very valuable, of the Indian Officers who are here present.

Colonel the Hon. H. LEGGE, 9th Lancers: Sir Beauchamp Walker and gentlemen, I feel that as I have the honour to command a lance regiment I may be permitted to say something upon this subject which has been so ably brought forward by the lecturer to-day. I think that the thanks of all lance Officers are due to an Officer of another branch of the Service for bringing the matter forward, and reading the very valuable paper which we have just heard. The evidence that he has brought forward in favour of the lance is, to my mind, overwhelming. The authorities that he has quoted are very numerous, and the views opposed to it are in such a small minority that I think there can be no doubt at all of the utility of the lance as a weapon. It is interesting to know that every European army, except the Austrian, at present has lance regiments, and that the Germans are increasing the number of their lancers. Colonel Elias has told us that the reason the Germans are increasing the number of their lancers is, in consequence of the lessons they have derived from the wars at the beginning of this century, and it was these very wars, at the beginning of this century, that first induced the English authorities to arm some of our cavalry with lances. In the historical record of the 9th Lancers I find it stated, with reference to the year 1816, that the experience acquired during the war of the value and importance of cavalry equipped with the lance, which weapon had been laid aside by the British horse for 200 years, led to the introduction of that weapon in that year. On the 19th September the authority of the Prince Regent was granted to the 9th, 12th, 16th, and 23rd Regiments of Light Dragoons to be armed and equipped with lances and, in consequence of that arrangement, to discontinue the carbine. It seems rather curious that the carbine should be discontinued, but that apparently was considered a necessary consequence of arming regiments with lances. It was reintroduced, as far as my regiment is concerned, in 1878, and was

found very useful shortly afterwards. The chief questions that appear to me to arise for consideration are the number of weapons the lancer should carry, and the proportion of lancers you should have in your cavalry. We have heard suggestions for arming lancers with the lance, carbine, sword, and revolver. I must say that I think that is far too many weapons. There is a great tendency to make a man Jack of all trades and master of none. I am fully confident myself that with the lance and carbine lancers can do their work just as well, do just as great execution, and be just as formidable to the foe as regiments armed with sword and carbine. I do not think, therefore, there is any necessity for the lancer to carry a sword at all. I have not only in my small experience never seen a man armed with a lance require to use the sword, but I have never been able to find anybody who could tell me that they had ever seen it done. Therefore, I cannot think the sword is any use to the lancer at all. When we have to carry swords we place them on the saddle, but I should like to see the sword taken away altogether. I think the carbine is necessary, and if it is thought necessary to give the lancer a third weapon, it seems to me that the revolver would be likely to do as much harm to friends as to foes in a *mélée*. I think, however, that a double-barrelled pistol would be of some use, because a man with only two barrels to his weapon would be careful how to use it, and he would not fire it all round as he might do a revolver. I believe myself that, with the lance and carbine, the lancer is equipped as he ought to be. The other question on which I would like to say a few words is that of the proportion of lances. Some armies, as we hear, have lances in the front rank and swords in the rear, the idea being that the lance is the weapon for the shock, and the sword the weapon for the *mélée*. If cavalry service consisted merely of shock and *mélée* and the two ranks could be kept intact that might be very good, but you must bear in mind that casualties will occur in the front rank which are filled up by the rear rank; that during a charge, in order that horses may gallop, they must open out to a certain extent, and if they open out too much the gaps thus caused may be filled up by the rear rank. There is also another point which I think is generally admitted, that is that though in practising the charge you may keep your rear rank together at its proper distance from the front rank, yet when it comes to actual combat you will find the boldest men and the fastest horses will get to the front and the less bold men and slower horses will drop back and form the rear rank. Therefore, I think it is far better to arm the whole regiment with the lance. With regard to the question of the proportion of lancers to the others, I think one lancer regiment to every cavalry brigade would be a very useful proportion and one that I should strongly recommend.

Colonel JOHN FRYER, C.B., late Commanding 6th Carabiniers : I do not propose to enter into the details of the arming of cavalry, as that would embrace firearms, but to say one or two words on the special and interesting subject which has been brought before us to-day so opportunely by my friend Colonel Elias, namely, on "Lancers and Lances," and to compare the two weapons of the same class for hand-to-hand encounter. It is a generally accepted fact among all those who have practised the use of the sword, that the most telling and deadly stroke with that weapon is the point; that being so, the lance having a longer reach has the advantage on that score as well as in steadiness and force of thrust. Then the lance has a double advantage also in its guard, having a bar above and below the grip to the cut of an adversary. That is, holding the lance in the middle you have a double guard. I take it the meaning of the lecturer was to speak of the value of the lance in contradistinction to the sword, both being of the same genus. Of course you cannot compare long-distance firearms with hand-to-hand weapons, therefore we will compare the lance with the sword. I will give three comparisons. First, in single combat, the best man, either with lance or sword, would probably win the encounter. Secondly, with two men equally brilliant in the use of their weapons I think the lance would have the best of the bout. Third, and I think by no means a bad test, is the encounter between two duffers which I have often witnessed, and you will find the lancer generally give the swordsman the first "poker," the sword being a practically harmless weapon in such hands. That is, taking men together who are not brilliant either as swordsmen or lancers, I think you will find the lancers will have the best of it. I only heard the other day when I was in Hanover of an encounter there, and a bet made by an Officer of the 9th Uhlans, who singly with a lance challenged any four of his

brother Officers of hussars with swords, all four together. The challenge was accepted. Well, gentlemen, I will tell you what the result was: he had two of them out of the saddle more quickly than I could say it, he then encountered the third and ran him through, and as to the fourth, who was coming round in his rear, he turned round and after a bout of about half a minute he had run him through also. I think you may quite say that the Germans have implicit faith in the lance, and this little affair having taken place I think it only strengthened the opinion, especially in that one particular regiment. I see our worthy lecturer has quoted Captain Nolan with regard to the battle of Aliwal. He says: "When the 16th Lancers broke into the Sikh squares at Aliwal many of the lancers were laid low by the Sikh swordsmen in the *mélée* which ensued because they were then unable to use their lances." About ten days ago I was in conversation with a very distinguished General in our Service who was a quiet witness, lying on his stomach, of that great encounter, and he told me that the 16th, after the first charge, got into the square, and for a minute or two he said there was hardly any sound whatever, but at the end of that minute or two the Sikhs were seen running pell mell in every direction with the 16th after them. I think that gives you an idea that as against the sword, the cutting weapon, the lance is the better weapon of the two. I have not had the honour of serving in a lancer regiment, as my friend Colonel Legge has. I served for many years with a regiment armed with the sword and carbine, but I have the very highest opinion of the lance. I believe the lance to be a magnificent weapon, and I should be very pleased to see our equipment very largely increased in that particular weapon. I think we are greatly indebted to Colonel Elias, who belongs to another branch of the Service, for bringing forward this most interesting discussion.

Lieutenant-Colonel DAVISON, 16th Lancers: At the battle of Aliwal, the 16th charged in succession of squadrons and wings. Altogether there were 57 men and 2 Officers killed and 66 horses, but hardly any of those horses were killed by sabres, they were nearly all shot. Two Officers were shot, and there were six other Officers wounded, five with bullets. With regard to the Sikhs, certainly a few men laid down their muskets and took up their swords to kill the wounded men, but very few men were killed unless they had been wounded first. Then in the Soudan, England had to arm her cavalry with spears taken from the Arabs. The 10th and 19th Hussars after the battle of Teb found their horses would not go near the bush where the Arabs were, and they could not reach them with their swords, therefore they had to get spears from the dead Arabs and arm themselves with them. I think that is a very strong test of the value of lances.

The CHAIRMAN: I hope the discussion is not going to end here. I have a list of those present, and I see amongst them more than one who can give us valuable war experience.

Colonel BOYLE, 11th Bengal Cavalry: I only rise, Sir, in order that the discussion may be continued. I see people here much more competent to join in it than myself. I did not come with any intention or idea of taking part in the discussion. I have not had the advantage of seeing this most able paper previously; and I therefore feel at a disadvantage. But two or three ideas have occurred to me in the course of listening to the paper, and I venture to say one or two words about them. The lecturer says that there is a weak point in the lance where the head joins the shaft. "The head is fixed on with shellac. Unless they are very well made, the part where the head is joined on to the shaft is a weak point in lances." No doubt, "unless they are very well made;" but they can perfectly well be so fitted as to leave the join by no means the weakest part of the lance, if the sockets are properly heated, and the top of the bamboo is not too much pared away. It must be cut to take off the skin, and if put into a properly heated socket it can be fitted with shellac almost stronger than any other part of the lance. I am sorry to say I am on the unpopular side with regard to the much vexed and discussed question—whether lancers should have a sword. I am disposed to think that the lancer ought to carry a sword. Of course the question very much depends upon the cognate question whether the lancer armed with the carbine should carry his weapon on his person or not. If he always carries his carbine slung across his back, in action or on service, or anywhere near the enemy, the question becomes entirely different to what it is if the carbine

is carried in a bucket. A man may be unhorsed; his lance probably flies from his hand; and if he has no sword, and his carbine is not on his back, he is left entirely defenceless. Then there are other duties; men are not always on horseback, they have at times to take charge of prisoners, and there are other miscellaneous duties constantly occurring for which a man armed only with a lance is not properly armed, the lance being an admirable weapon on horseback, but not much use when the man is on foot. Even in action itself it may be very advisable for a man to have a sword. Upon one occasion a squadron of the regiment I had the honour of commanding, in number some ninety lances, was engaged, and at the close of the action twenty-three of the lances were found on examination next day to be unserviceable owing to their being cut by the swords of the enemy near the head, probably, in many cases, immediately after or just before the lance actually entered the body of the men who cut them. At any rate, some of the lances were so badly wounded that any stress upon them would have broken off the head, and the men would have been defenceless or unarmed if they had not had swords to fall back upon. So that that I think is also very much in favour of the sword. It depends, as I have said, in great measure on whether the carbine is carried on the body or not—for which practice I am a strong advocate. With regard to the point made by Colonel Fryer as to the lance being probably a more efficient weapon in the hand of an inexperienced soldier than the sword, I may point out that the lecturer cited an American opinion, which appears to be one of an important kind, to the effect that the lance is almost useless for untrained men. No doubt the sword is much in the same condition for *absolutely* untrained men. With regard to the German trial mentioned by the same speaker, I have no doubt that it occurred in a lancer regiment. I have always observed that it makes a great difference in the results of such trials whether the combatants belong to a regiment armed with lances or to a regiment armed with swords. As to the lance being better than a cutting weapon in India and in the East generally, besides the matter on which I remarked just now of the heads of the lances being actually liable to be cut off, or at any rate very severely wounded, by the sharp swords of Eastern warriors, we must remember the very well-known fact as to the sharpness of the swords carried by the Eastern races as compared with ours. No one has put this point better than Captain Nolan did in the book quoted by the lecturer. He described the fearful cuts made by the curved sabres of Indian horsemen as compared with those made by the swords of British soldiers; the former being carefully sheathed in wooden scabbards which are so arranged that the edge really never touches the scabbard at all, and are always very carefully drawn and returned. I need say nothing at all before this audience about the very well-known destruction between that method of keeping and carrying swords and that which is in use in our own Service.

Lieutenant-General Sir JOHN WATSON, *U.C.*: Lest the discussion should drop, gentlemen, two or three of my friends here have asked me to speak. I was a lancer once, I am only a fossil one now, but, perhaps, without entering into any discussion, I might refer you to the old proverb that a pennyworth of practice is worth a pound of argument. Thirty years ago I used to ride, and rode for many months, alongside the regiment which Colonel Legge now commands—the 9th Lancers. They were armed then with things more like boathooks than lances—heavy ashen poles—but the execution they did with them was something wonderful. Sir Hope Grant always got hold of a bamboo lance if he could, and it was owing to his influence, I think, that bamboo lances were introduced into the Army, and we all have bamboo lances now. With regard to my practice, I will tell you what I did when I had a regiment to arm and was not interfered with by orders from Headquarters: I armed the men with a bamboo lance, a light sword and pistol. I had two-thirds of my squadron lancers, and the other third had carbines instead of lances. I did not place my carbines in the rear rank, but I placed them upon either flank, because I found in manœuvring (as I always did in squadron column of fours) I had my carbines in front when I was advancing and my carbines in the rear when I was retiring, so that I could, without disarranging the formation of the rest of my squadron, send them to the front or drop them to the rear without interfering with the main body of the lancers. What I did myself, although it is many years ago, I still think is about the best form of armament. From my own experi-

ence of lancers, and of what the 9th Lancers used to do in the Mutiny Campaign, I still hold that the lance is the queen of weapons, and I hope it will always hold that place. One main difficulty in having a large body of lancers in our Army is not only the difficulty of training the men but of training the horse, because a lancer to be a good lancer must not only know how to use the lance, but he must have his horse most thoroughly and perfectly in hand, otherwise he is useless. Therefore, I do not know whether it is any use increasing the number of lancers, unless we have a greater opportunity of training both men and horses to the use of it.

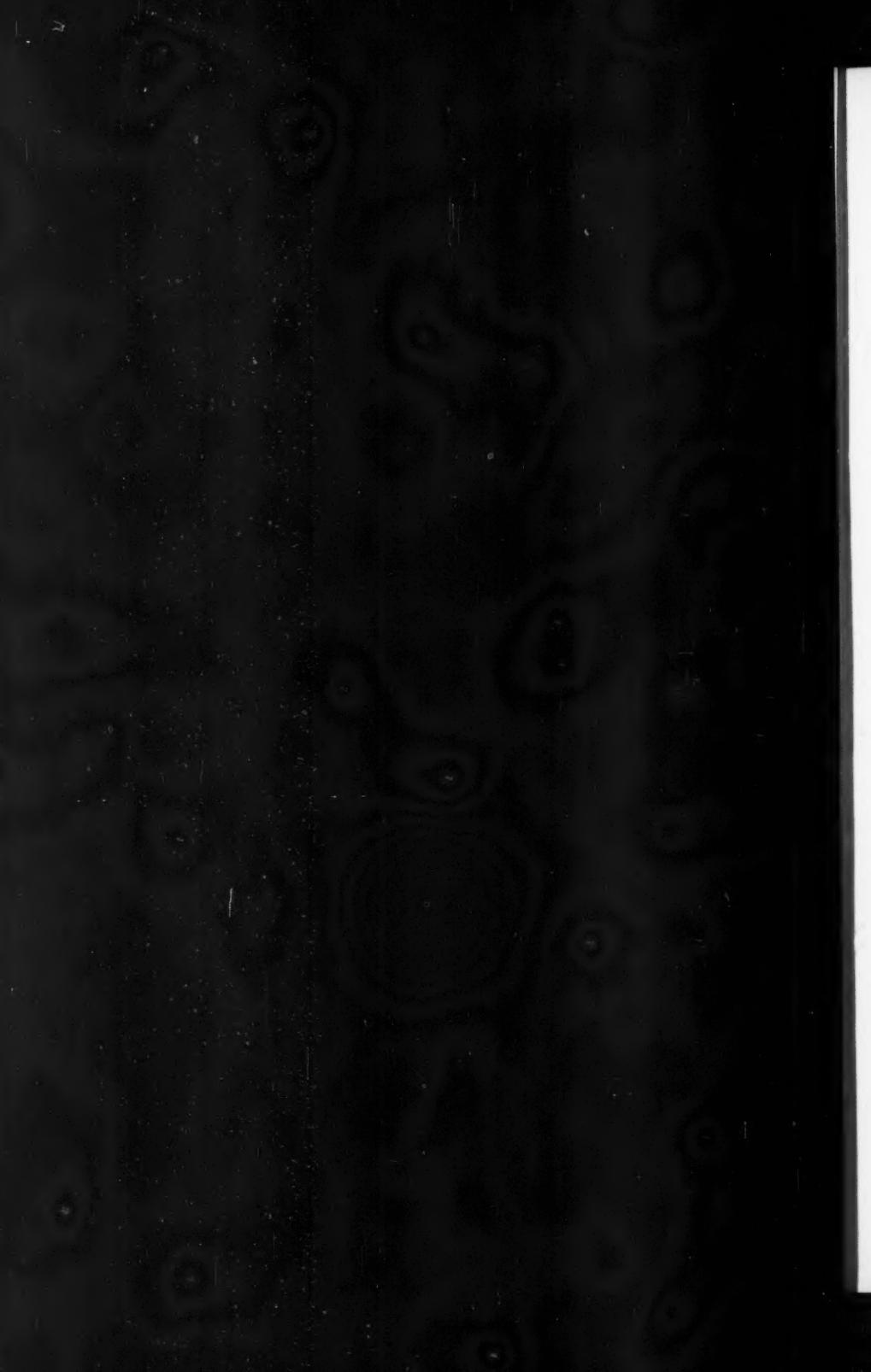
Colonel ELIAS: I think there is very little left for me to say. Colonel Legge spoke to you about the lancers being encumbered with so many weapons. I brought forward different propositions which did advocate a great many, but I must say, if I may give an opinion as an infantry man, I agree with Colonel Legge. I do not see how a man can conveniently ride and mount and dismount when he has three or four weapons, and I should think a lance and a carbine ought to carry him very far. Of course there is the occasion that Colonel Boyle noticed—against the sharp Indian swords; and if men get the heads of their lances cut off they would be in a rather unfortunate position, perhaps, if they had not a sword or revolver to fall back upon. At any rate, I suppose we have not to decide it exactly now: we must leave it an open question at present.¹ I dare say what I read did not give the full facts of the case. In the account I read it certainly did say that the Sikhs had wounded a good many lancers with swords, but it is possible they may only have wounded a few, and of course it is very well known that even if they did, the lancers got very much the best of it. My allusion was only meant to show that the lance was an awkward weapon when the man who uses it is jammed up in a crowd. Then Colonel Boyle spoke of joining on the heads of lances to the shafts. I do not profess to know much about the manufacture of lances, but I was told that that was the weak point; but I believe if the iron is carried a long way down the shaft on each side it is all right. I have no doubt, as General Watson says, that it is necessary to train the horse well, and even for swordsmanship I suppose you must have a well-trained horse too. I am sure General Watson's mixture of carbines and swords was a most excellent one. The distribution of different weapons is a question that I think might be decided in more ways than one. I mean to say you might have, as I said before, the lance and the carbine in the same squadron or regiment or brigade, and on different occasions it might be advisable to distribute them differently. I suppose if there is only one regiment you must have the two arms in the same regiment. Perhaps, in a large body of cavalry, it might be better to have each regiment armed uniformly throughout, but various arms in the brigade; certainly, if I were a cavalry commander, I should like to be able to decide that for myself, as General Watson did.

The CHAIRMAN: It only remains for me to sum up the lecture, which has proved as interesting as I hoped it would be when I was asked to take the Chair. I must remind Colonel Elias that he somehow missed a cavalry authority for whom I have the highest opinion amongst all those who have ever written upon cavalry, and that is the author of a book which never leaves my travelling bag, De Brack, who has written incomparably, in my opinion, the best book on cavalry that ever was published. I naturally, when the lecture was sent to me three days ago, pulled De Brack out, and looked at the chapter in which he particularly speaks of the lance, and his words are, in his short *terse French*, "The lance is the *arme blanche* of which the moral effect is the most powerful, and of which the blow is the most murderous." He then, as he always does, in the manner in which the whole book is written in the shape of question and answer, enters into how the lance is to be used. He particularly points to one fact which to me appears the only weak point in the lance, and that is that it sometimes happens that in giving a powerful blow with it the lance is left with the point in the body, and the lancer is unable to extricate his weapon. Unless he has a sword, he would therefore be powerless in a *mélée*. The only time that I ever was mixed up with a lance was when we ran away from the Chinese. I had an orderly with me from one of the Native Indian

¹ I am very glad to hear Colonel Fryer so manfully upholding the lance. Both he and Colonel Davison spoke of Aliwal.

regiments who was armed with a lance, and when we came out my good friend Walter Fane observing that he was without his lance, asked him where his lance was. He said he had left it in the body of a Chinaman. I do not think he had. I thought he found it so cumbersome in our hurried flight that he probably got rid of it in some other way, but I never forgot the incident. The Germans after 1870 introduced the carbine into their lancer regiments by giving carbines to one of the four divisions of which each squadron was composed. Now, I fancy they have given them all carbines; but I perfectly remember in the China War our two native cavalry regiments had only a certain number of carbines distributed amongst them, and I think they were passed on from hand to hand when the men went on outpost duty. I know the Indian Government, which is not always much wiser than our own, armed the whole of Fane's regiment—only two squadrons—with carbines. I was left with my friend Peter Lumden to assist Sir R. Napier in the embarkation of the cavalry and artillery in Calcutta, and I do not know who it was came to me and said, "For God's sake, Walker, if you have any influence with the Chief, get him to take away some of these carbines." It ended in my making a special report to Sir Robert Napier, who, after considering the question very carefully, and as he told me the next day, having sat up half the night reading authorities, and consulting everybody he could get hold of, formed the conclusion that they should not all have carbines, but only a certain proportion. I forget what that proportion was. Colonel Elias, in his lecture, mentioned the pennon. I honestly confess, having devoted my mind to considerable thought on cavalry subjects, I never could make out what the use of the pennon was. I was told that the advantage of it was to frighten the enemy's horses, but Colonel Elias tell us that the disadvantage of it is that you frighten the enemy's horse to the extent that he swerves away, and spoils your point. The opinion that I formed was that pricking the nose of your enemy's horse, if he was not too close to you at the time, was far more likely to get him off than the pennon, and, certainly, having been a great deal employed in reconnoitring duty, I can answer for the disadvantage of the pennons that they show a great deal more than one wants to show; indeed, there are times when unless the lances are carried on the thigh they tell more to the enemy than perhaps is altogether advantageous, because you see the points of the lances long before you distinguish the uniform of those who carry them. I remember another point upon which I think General Sir John Watson will probably agree with me. When I was a cavalry soldier I never would allow a man to call himself a made soldier until he had been three years in the regiment. I always called him a recruit up to that time, and I then upon considering the matter came to the conclusion that no lancer was really a made man until he had been four years at his work: that it took one more year to make a good lancer than it did to make a good dragoon. How that opinion will go down in the present days of short service, and turning men out just as they are beginning to get into their work, I do not quite know. I think there is little doubt that the lance is not the weapon of which you can make the most use in the actual *mélée*, and there is certainly one point in favour of the sword. Though I am a strong advocate for pointing with the sword on every possible occasion, in the *mélée* you must cut yourself out; you cannot point yourself out, because you simply leave the sword in the man's body, and he cuts you over the head before you can get it out again. Therefore, in the actual *mélée*, if you cannot use your lance, but are reduced to the sword, cut yourself out. It has warmed my heart to see a 16th Lancer man on his legs, because when I as an infantry Captain went into the cavalry the man who made me was an old 16th Lancer of the name of Blinkhorn, who was the riding-master of my regiment and a subaltern in my troop, and who was, without exception, the best and most practical soldier I ever talked to. I learnt most from him during a long march that I had with him of eighteen or twenty days. I really learnt more of my duties by riding with Blinkhorn than I did in any other way. Blinkhorn told me that one of the greatest nuisances in India was that the broken Indians threw themselves down on their faces with a musket, if they had one, under them, and as you passed them they got up and fired at you. He said that in the old 16th they had one invariable rule when in pursuit, and it is in pursuit that perhaps lancers are more formidable than upon any other occasion except in the great shock. He said: "We had one invariable rule,

and that was that where we saw a fellow lying down on the ground we reversed the lance and dropped the point of it between his shoulder-blades, which effectually put a stop to his getting up and firing at us from behind." There was one very noted instance of that in the case of Goddard of the 14th Light Dragoons, who was shot by a man after one of the great Sikh battles whom he had saved from a lancer who was riding near him and wanted to do this. He said, "Oh! no, let the fellow alone," and the return he had was that this man jumped up from his recumbent position and shot him through the ankle. That I remember as well as possible, he being a county man of my own, I often heard the story told. I think we are very much indebted to Colonel Elias for his lecture, not the less so because he has compressed a very considerable amount of information into a short lecture, and I wish as a constant attendant on the lectures here, and through the kindness of my friends often in the Chair, that I might be allowed to make the remark that there is no greater mistake than giving a very long lecture, because it stops discussion afterwards, and, after all, however good the lecture may be, we get a great deal from the discussion, which in many cases brings out the experience of Officers, and the careful thought which they have given to these matters. I, therefore, ask you to allow me to tender your thanks to Colonel Elias for his lecture, and I may also personally, as Chairman, be allowed to say that we owe much thanks to the gentlemen who have spoken upon this occasion.



Friday, May 10, 1889.

MAJOR-GENERAL PHILIP SMITH, C.B. (Commanding Home District),
Member of Council, in the Chair.

BATTLE TRAINING OF REGIMENTAL OFFICERS.

By Colonel A. B. TULLOCH, C.B.

Colonel TULLOCH: Before commencing to read this paper I wish to state that when I wrote out the first half of it last October, on the termination of my command, I had no idea of reading a paper on the subject. I simply considered it my duty on finishing my command to make certain notes of what I considered were defects with reference to our present modern method of troop training, and to submit them. A high authority very kindly suggested that the subject was one which should be discussed in this Institution. Naturally I was proud that such a suggestion should be made, and the Council very kindly gave me a day for it. The title of the paper is possibly rather sensational. All I can say is, that it is difficult for me to select another. Military training does not exactly express what I mean: military training consists of a variety of exercises, beginning at squad drill, company drill, battalion drill, musketry drill, and so forth, but battle training, as I intend it, means the tactical instruction by the Colonel with the assembled battalion—a thorough course of instruction practically carried out, and to which must be added the verbal instruction of the Officers assembled in one body by the Commanding Officer of the battalion. It is quite possible that some Officers will not agree with me. All I can say is, I have thought the subject out very carefully, and when abroad I have compared our system with that of the French and German Armies. I may mention I have never had the slightest difficulty with French or German Officers when looking on at their manœuvres; the Officers of both these countries have been only too ready to give me any information I wanted, they used even to let me know when any important manœuvre was going to take place in order that I might be there in time. Of course the paper itself is almost too professional, consisting mainly as it does of purely regimental matters, but, nevertheless, I do hope that my ideas may be improved upon by others, and especially by those Officers who are looking forward to that most responsible, but proudest position a soldier can hold, the command of a British regiment.

THERE can be but few Colonels who, during their four years' tenure of command, have not wished to submit suggestions of various descriptions in connection with their duties. Occasionally these ideas are placed on record; but, as a rule, a very proper, diffident feeling that the authorities know all about what is necessary, and have very good reasons for everything done or undone, prevents a Commanding Officer from bringing forward his views.

I trust, however, that as I have now finished my term of regimental command, during six months of which I was in command of a brigade, I shall not be considered presumptuous in expressing my opinions on certain weak points of our regimental system in training Officers and men for the *raison d'être* of their maintenance by the State, viz., the day of battle.

Notwithstanding the adverse views of innumerable critics, I maintain that in what is usually known as drill, in discipline, and in interior economy, we are certainly equally to, and in many cases superior to, the best Continental troops. In a good regiment, everything inside the barrack railings is as near perfection as possible, but in that practical training which can only be imparted on other ground than the barrack square, we are, I have no hesitation in saying, lamentably deficient. Individual Commanding Officers may break through the ordinary routine of our Service, and consider it their duty to do more than will enable their regiments to pass a creditable annual inspection; but putting on one side what is now military history, one has only to look on at an English field-day where a free hand is given to the Commanders attacking and defending, to see at once that far too many regimental Officers seem almost bewildered at finding themselves called upon to do work which to them is almost like being required suddenly to speak a new language; the grammar of that language which is contained in the drill-book and in which they are so perfect on the parade-ground, they find themselves unable to make use of. With some Commanding Officers who are given temporary command of a brigade for the day, the spectacle is occasionally painful, showing very plainly how little they have really studied their profession, and yet these same Officers may know the drill-book perfectly, and be quite capable of manoeuvring three or four battalions in what is known as steady brigade drill.

In mentioning steady drill, I in no way presume to suggest that it is unnecessary. Precise machine-like drill most rigidly carried out is the necessary foundation on which battle training has afterwards to be built. No one who has watched the rigid drill and iron parade-ground discipline of Prussian battalions before commencing their field manoeuvres can doubt its use, even if one's own professional experience did not prove its inestimable value as a means to an end; but unfortunately we do not as yet go sufficiently beyond this necessary foundation of steady drill.

During the last few years we have, in company tactical courses; instruction in night attacks; infantry fire, and such like, begun to move in the right direction, but something more is necessary, and it is for the purpose of bringing forward a Commanding Officer's ideas on the subject, that I venture with the greatest diffidence to submit my views on this important question.

Before stating what I think requisite for the proper tactical training of a regiment, it will be advisable to refer to the professional instruction which young Officers receive before they join.

The Service is supplied with Officers from three sources: the Military College at Sandhurst, the militia, and the ranks. These

last are comparatively so few in number that they are hardly worth mentioning excepting to say that a great proportion are now gentlemen; several being Sandhurst failures who could not afford the cost of the militia trainings. To get into the Military College, a competitive examination in general education has to be passed, this has now become so severe that upwards of half marks have to be obtained in the few subjects allowed to be taken up, and every year the figure required for passing is getting higher. Certainly since French and German were made two of the four best-marked subjects, no fault can be found with the general education of Officers joining from Sandhurst; the only defect seems to be the almost absurd amount of algebra now necessary for a good place in mathematics. During the year, or rather eight months at Sandhurst, professional subjects only are taught, the special value of the instruction being its practical nature. The passing out standard is not difficult, and might, I think, be raised without requiring cadets to study too much; at present they seem to have rather more time for amusement than is necessary. If some of these leisure hours could be added to the practical outdoor work, it would be greatly to the advantage of these future Officers, few will ever have such chances of thorough instruction again, and it seems a mistake not to oblige them to take every possible advantage of it.

With the exception of one young Officer of defective principles who got into such financial trouble that he had to leave the Service, all who have come to my regiment from Sandhurst since I obtained command of it, have been first rate material, strong, active young men, of good education, and well instructed in everything they had learnt at the College.

All things considered, I venture to think it a misfortune that we cannot get all our Officers through Sandhurst only. The Officers coming from the militia are composed of those who have been unsuccessful in their attempts to enter Sandhurst, or those whose education has been so neglected that they would have no chance if they tried for it, and a few well-educated men who have developed a taste for soldiering when past the Sandhurst age.

Militia candidates have to pass a qualifying examination in general education; that this is not particularly hard may be inferred from the fact that less than quarter marks only are necessary in papers which are distinctly easier than those for entrance to Sandhurst. A large percentage of the Sandhurst failures having made enough marks to pass the militia educational test, are not required to go up for this examination at all. Militia candidates are also obliged to pass a competitive examination in professional subjects. It has been stated that these papers are more difficult than those given to cadets at the Military College, but as the examination is only a written one, such a test without a practical course is of very little value, when compared with Sandhurst instruction. Unfortunately when actually tried in outdoor work after joining, I have found that some Officers from the militia really knew next to nothing about those subjects in which they had passed a competitive examination; their knowledge was of

the most parrot-like description; I have found them quite unable even to point out how an outpost should be strengthened, or a small position entrenched; and when asked to make a little sketch, showing positions of picket and sentries, the production has been such as an intelligent private soldier might have attempted. They said they had never learned anything of the kind; as such practical work was not required in their examination. Naturally they were ordered to learn what they could, but until they had an opportunity of attending a garrison class, they would be in comparative ignorance of subjects with which Sandhurst cadets have a very fair acquaintance, and which every Officer ought to know on joining.

A strong point has been made by those who believe in the system of entrance by the militia, that the candidates know their drill. All I can say is that I have never yet found them to be in any way better than the Sandhurst cadets. Two months' preliminary drill, and then two periods of one month each at yearly intervals, are not likely to make lasting impressions.

The argument that the present system answers, in that it fills the subalterns' lists of militia regiments, and that it is a cheap one for the public, should not be allowed to carry any weight unless the subalterns entering the line are properly qualified. This, I think, might be arranged for, and without putting the candidates to additional expense. There would not also be much reason to complain (admitting that the educational test is so much below Sandhurst), if a fair colloquial knowledge of either French or German were added. Four months' residence abroad in a family where no English is spoken would be sufficient for this.

As regards surveying and a practical knowledge of field fortification, proper courses of instruction are necessary. Militia Officers cannot go to Chatham, but there is no reason why a special school should not be instituted for their benefit, say, at Aldershot—Officers to pay the actual cost of their teaching. There are many well-qualified retired Officers who would be only too glad of the occupation, especially if such added to their incomes. It will be said this would be an additional expense for militia candidates, but it would not be so if their second annual training were abolished in favour of the school of instruction referred to; it seems hardly credible, but I have several times been informed that a month's mess bill, and attendant and unavoidable expenses, when out with many militia regiments, comes to $40l$. Now, with proper arrangements, one quarter of this amount should be sufficient to meet the cost of six weeks' instruction in elementary field fortification and surveying, which period would be long enough when working at least six hours per day. Militia candidates should be required to get a certificate from the school of instruction before being gazetted. If properly qualified in book work to benefit by a practical course, they might be allowed to attend the school at any time. I consider it advisable to point out the necessity for their having learnt what is required before attending a field works and surveying school of instruction, because young gentlemen can enter the militia without any examination whatever;

in many cases they can neither write nor spell correctly, and yet have the right to put on their cards that they belong to a regiment of the line. Such English Officers of the reserve forces at times astonish their Continental brethren when on their travels, and give anything but an exalted idea of the commissioned ranks of the English Army.

To sum up—young Officers who now join are, as regards education, decidedly superior to what they were even twenty years ago, and if the militia candidates were properly instructed in field fortification and military sketching, little more would be required. The social status from which Officers come is quite as good as ever it was, and in some respects there is an improvement; the young men who in former days were occasionally sent into the line, and extravagantly maintained by their wealthy *nouveaux riches* relations for a few years till they got their companies, have been eliminated. As a rule, young Officers joining the infantry intend making a real business of soldiering.

Not very long since, a good deal of nonsense was current about young Officers being mere bookworms, and that so much learning (?) would cause physical degeneration; it might just as well be said that naval Officers were becoming spectacled professors because they had now to go rather deeply into mathematics and electricity for torpedo work. The only physical defect I have ever noticed has been that of short sight; fortunately recent regulations make the medical examination on this point much stricter than it was. Infantry Officers obliged to use glasses have done uncommonly good service, but now that there is so much long-range work, and when there is such a superabundant choice of candidates, no one obliged to use an eyeglass ought to receive a commission. As for the physical qualifications of young Officers, it would be impossible to wish for anything better. A regimental football team is a sight worth looking at; for such young athletes a Roman trainer of gladiators would have offered many *aurei*. The natural adventure-loving proclivities of the race, the physical training from the earliest days of schoolboy life, to say nothing of the energetic amusements when in the Service—so different from those of Continental Officers—and that hunting instinct so strongly engrained in all which causes the British Officer to undergo almost any self-denial or privation in pursuit of sport, be the object what it may, from a snipe to a tiger, gives us the most perfect material for leaders of men.

With such qualifications to start with, it must be entirely owing to defects in our system of regimental instruction that our Officers are not just as superior to those of the Continent in professional matters as they are in body and race qualifications so suitable above all others for a soldier's life.

If this defective training were simply the result of neglect and ignorance of the value of tactical instruction, the remedy at every station would be simple. Unfortunately, owing to the peculiar garrison duty which British regiments have to perform in different parts of the world, suitable ground for battle training is often most difficult

to obtain. Some foreign stations, such as Malta, almost preclude proper instruction, whilst at home a Commanding Officer must, in the absence of proper ground, obtain permission from landowners, which is not always an easy matter, but by no means so difficult as is generally supposed, and a very little assistance from the proper authorities in getting permission for troops to manoeuvre on open ground in the vicinity of military stations would greatly facilitate this. Government land even is not always turned to proper account, a barrack-square has so long been considered sufficient for the requirements of a regiment that wide expanses of War Department land, within easy reach of a large garrison, have before now been let out at a small rent for grazing, and the troops prohibited from using them; in one case, a battery of field artillery was actually forbidden to use the large drill-ground attached to the barracks till a farmer had got his annual crop of hay off it. Foreign armies are very differently situated—on the Continent every garrison of any size has its exercise-ground, often a square mile in extent, and during autumn manoeuvres the army has practically the run of the whole country. To hope for such advantages in the United Kingdom would be useless; but still Commanding Officers who are determined to train their battalions as they ought to be trained can generally manage to work over ground, provided no damage is done to crops or fences; this has been done even in Ireland, where the red coat is not in particular favour. Commanding Officers whose regiments are at either of the camps of instruction have immense advantage over those in other stations; the value of even three or four weeks in camp near suitable ground are so great that no Officer commanding a line battalion can ever see a volunteer regiment in tents on open down land without envying the facilities given to the auxiliary forces for learning their work.

In India we are, as regards training-ground, quite on an equality with Continental troops, and on some foreign stations, such as South Africa and Egypt, better exercising ground could not be wished for; but in troop training, as in everything else, "where there's a will there's a way," and if battle training were required of all Commanding Officers, they would find means to carry it out; but to do so effectually, they must be properly backed up in the work. One great drawback to the proper training of their regiments is the number of men taken away for various employments by the Staff and Departments; servants, batmen, orderlies, engineer working parties, ordnance fatigues, and such like, often at times reduce a battalion to such an extent as to render hopeless the efforts of the most energetic Commanding Officer. Occasionally a C.R.E. or Departmental Officer arranges with a Colonel that his men shall not be taken away for one or two mornings in the week, but to get hold of the numerous orderlies, servants, batmen, &c., even for an early parade, is a much more difficult matter, although these same orderlies may not actually be required at the offices for which they have been requisitioned before nine or even ten o'clock.

The first thing to be done is to place every employed man, without

any exception, at his Colonel's disposal for, say, half a day in each week during the drill season, viz., from daylight till noon; on that day, every one, excepting the sick, a small regimental guard, and three or four police to patrol about the barracks, to be in the ranks; musketry (recruits excepted) and company training being suspended for the half day.

It may here be stated that the annual company training might be somewhat reduced as regards time if recruits on joining were put through a short course of field works as well as musketry.

This special weekly parade should be exclusively for tactical instruction. Breakfasting at or before daybreak, there would be ample time for work even if the ground were six or seven miles away. The scheme for the day should be published in regimental orders the week before, and all Officers required to examine the ground and give in a short report of a few lines and a rough eye-sketch of the dispositions each would adopt to meet the object in view. Possibly some of the younger Officers might not produce anything remarkable, but obliging them to work out either attack or defence by themselves and then showing how it should be done would be of immense value; there could be no better training for them than practically seeing the mistakes they had made.

Each scheme should be done twice: the first time without ammunition, the second with blank cartridge; the annual allowance being increased for this purpose.

The day after each exercise, all Officers should be assembled, and the Commanding Officer should himself point out all the mistakes made, and then answer all questions which the young Officers especially should be encouraged to ask, so that they may fully benefit by what has been done.

It may be said that a tactical brigade day once a week would fulfil all that is required, but this is not so. During the progress of tactical instruction under the Commanding Officer, he can at once stop the movements if anything is going decidedly wrong, and correct it, or begin the whole exercise over again if necessary. His parade is purely for instruction, and occasionally mistakes made and then and there corrected are the very best teaching that can be given. Naturally the General (if there be one at the station) would come to look on, but he should be most careful never to interfere, except in taking notes for after discussion with the Colonel.

Where circumstances permit, it is very useful to assemble all the non-commissioned officers in the recreation room the day after some specially interesting field-day, and give them a short lecture on the work done, using a blackboard and chalk; the interest they take in the proceedings, and the latent talent some of them unmistakably show when questioned, will more than reward a Commanding Officer for any trouble he may take with them.

A mistake is sometimes made when regularly teaching non-commissioned officers anything beyond barrack-square work, in giving them matter to consider which is really above their comprehension; occasionally a brilliant exception may be found, but, as a rule, their

intellectual training has not been sufficient to enable them to benefit by any but the most elementary lectures. After going through a short course under a Garrison Instructor, they too often get a firm hold of a few maxims or principles, which they apply indiscriminately, without in the least considering what their relative bearing may be as regards other matters.

Excepting the senior Major (who would look over the papers and record all necessary observations on each, before passing them to the Colonel), all Officers present with a regiment during the winter months at home and the hot weather abroad, should be given a scheme once a fortnight, such as the defence of a house, the entrenching of a small position, the dispositions necessary for the defence of some particular bridge, and such like; the reports in each scheme to contain full details of dispositions proposed, working parties, &c. ; the sketches to be clear, but as simple as possible.

When the defence schemes were completed, attack schemes on the same posts or positions might be given. When giving out each scheme, a short lecture in the orderly-room by the Commanding Officer is advisable. The danger to guard against in these schemes is that of making them too grand; the number of men given in each case, and the time allowed, should be such as the Officers of different grades might actually have at their disposal on active service.

I am aware that at home during the winter time reconnaissance sketches and reports are made, but, excepting as instruction in field sketching, I fail to see what special benefit these sketches and reports may have. Too often a pretty picture, with beautifully tinted woods, houses, and streams, is held up for admiration; the production being generally that of some young Officer of artistic tastes. Whenever one of these pretty pictures was placed before me, I at once doubted its value, and an examination of the ground, as a rule, proved that truth had been sacrificed to art.

Several years ago at Aldershot there was a great craze for these reconnaissance sketches, and some Officers, whose military education had been neglected, got a good deal of assistance; a sapper corporal made quite a small income by supplying what was required in the way of drawing: I believe his charge was half-a-crown a sketch.

For cavalry Officers and even cavalry non-commissioned officers, rapid sketching and road reporting is particularly useful; but as regards the infantry, let them first of all be well exercised in those subjects which it is absolutely necessary they should know thoroughly. All Officers should, as part of their surveying instruction, be able to make a good road report; but Sandhurst or the Garrison Instructor should teach them that part of their work. As it is, or was, the office of the Assistant Quartermaster-General in home districts is periodically inundated with subalterns' road reports, forwarded by Commanding Officers, simply because reconnaissance work in the field is part of the Quartermaster-General's duty. Certainly it never could have been intended that in large garrisons he should become a surveying instructor. The magnificent schemes of some young Officers and non-commissioned officers, who would be puzzled how to com-

mand a picquet, are at times startling: such teaching is decidedly a move in the wrong direction. Even with Officers who some years ago were told off to work for the Intelligence Department in the scheme for home defence, the productions were astonishing: positions were taken up and reported on quite regardless of the direction in which they faced, or of the force which would be available to defend them.

Tactical instruction requires to be commenced with a small number of men, be they on paper or in actual existence; and one of the very best means for facilitating the instruction of Officers of all ranks is unquestionably the War Game, on a raised model, the invention of Colonel Shaw, who was formerly Garrison Instructor at Aldershot; the only improvement which seems possible is some simplification of the rules regarding losses. Kriegsspiel, with maps, is all very well for students at the Staff College, and those well advanced in the knowledge of their profession; but to enable young Officers to read country easily and get a proper eye for ground, nothing I have yet seen comes up to Colonel Shaw's invention; even for old Officers who have had the experience of several campaigns, the writing out of the instructions necessary for their different commanders in a war game scheme is most useful. Unquestionably every garrison ought to have a war game model, and its use should be compulsory. At first Officers are rather apt to be disheartened, not to say disgusted, when they make absurd mistakes and are shown up by the umpire; but in time they get over this, and when they at last beat a less skilful antagonist, are just as much in favour of the game as they were formerly against it.

During the winter at home and the hot seasons abroad, the war game is a very profitable way of occupying spare time; a game might be played once a fortnight, alternately with an outdoor scheme, each regiment in turn to have the use of the war game room; the Colonel to make his own arrangements and be chief umpire.

It will be said that regimental Officers have already as much as they can manage in the way of musketry, company tactics, signalling, &c.; all I can state in answer is, that I have seen such a course of instruction as I mention carried out without a whisper of its being found inconvenient; all the Officers seemed only too thankful to get a chance of being systematically taught their trade, and an occasional discussion in the ante-room about a scheme seemed to be quite an agreeable variation from the performances of some wonderful polo pony or the chances of a regimental horse winning a particular race at the next meeting. The equine vein (if I may use such an expression), which is more or less developed in every one born north of the English Channel, at times occupies, I venture to think, too much of some young Officers' thoughts, contrasting strangely with the conversation one hears, for instance, in a naval club, where guns, rams, and torpedoes are so often spoken of, showing what is uppermost in the nautical mind. No one can accuse naval Officers of being mere bookworms, or of caring less about sport when on shore than ourselves, but somehow their profession seems to be far more deeply

engrained in their nature than with us: cannot we soldiers take a leaf out of the naval book and work at our trade as our blue-jacket brothers do? In the Navy such a thing as a young Officer really ignorant of his profession is unknown; can the same be said of us? We have plenty of spare time and a first-rate material to work with; all that is needed is complete instruction.

Now, with regard to the scheme proposed, not even the most ancient field Officer could grumble at the addition of the fifteen or sixteen interesting tactical exercises during the drill season, even if they began at daybreak. The schemes and war games during the leave season would be not an unpleasant way of passing the time when wet or hot weather puts a stop to regular outdoor amusements; they need not prevent a single day's hunting at home or shooting abroad, as there would be a whole fortnight for the work, and, indeed, there could be no greater mistake than to place obstacles in the way of Officers getting away, during the slack season, for either of these amusements. Whenever young Officers stationed abroad can afford—say a week's shooting expedition—every facility should be given them for it; such expeditions are in themselves a species of military training. I have always noticed that good sportsmen are the best Officers, and are as keen at their trade of soldiering as they are at field amusements. To keep Officers continually within hail of a barrack-square, when there is really no necessity for the whole of them being present, is one of the surest methods of making them weary of their profession and slack in their work.

Of course, on the war game day, which would be only once a fortnight, everyone not on long leave would require to be present. The Commanding Officer and senior Major would have a good deal of additional work; but considering that an average of two hours per day for ordinary routine is really all that a Commanding Officer need pass in the orderly-room or drilling on his parade-ground, I don't think there would be any just grounds for saying the additional work would be too much. Of course a Commanding Officer can be all day in his orderly-room, and may almost have a fit if anyone else drills the regiment, but if he cannot trust his subordinates to do their duty, the difficulty does not reflect much credit on his own organization and management.

In giving an average of two hours per day, I do not, for one moment, mean to say this is all the time a Commanding Officer should be, so to say, on duty within the barrack-gates. Like the chief engineer on board a huge steamer, he must be always quietly observing that his subordinates are all doing what is required of them, that there is no friction anywhere, and that the whole mass of machinery is working smoothly and quietly.

The first criticisms of the scheme by the senior Major before forwarding them for the Colonel's observations would be most valuable instruction for him, particularly if it obliged him to study his profession rather more than some old Officers do at present. His remarks on the schemes would assist his Colonel and also the General in forming an opinion as to his professional knowledge

when noting his qualifications for promotion to that most responsible post, the command of a regiment, where one man carries in his hand the lives of many and the good name of all.

This short essay on "battle training" would be all I should desire to say on the subject, but during my service I have noticed that Officers can pick up useful ideas, not only from other armies, but occasionally also from other regiments in our own Service. I will therefore add a few details as regards regimental work, on the chance of some of them being made use of and improved upon by others.

One of the first subjects which exercises the mind of a Commanding Officer, especially if he commands a foreign battalion, is the musketry training of his drafts, for if the recruits have not been properly taught when a rifle was first placed in their hands, their subsequent instruction is very uphill work. Badly drilled drafts are rare, and besides, it is a defect which can soon be put right, but with recruits who have been allowed to become gun shy, it is a very different matter.

All things considered, I have come to the conclusion that it would be very advantageous to the home as well as to the foreign battalions if recruit musketry instruction could be carried out at the dépôt; this, of course, is principally a question of barrack accommodation and ranges, but where it can be done, the Assistant Adjutant and musketry sergeant of the home battalion might very well be borne on the strength of the dépôt, where they would also be available for militia recruits. If some re-arrangement of time would permit, it would add greatly to the service value of the militia and their reserve if they could be put through a line recruit's complete course with a few day's field-firing when they join at the dépôt; but on this subject Commanding Officers of militia regiments can speak with more authority than their colleagues in the line.

As regards musketry training in both home and foreign battalions, I trust I may not be considered captious when I say that we do not yet recognize the proper value of field-firing. Thanks to Colonel Tongue and those working with him, great progress has been made of late years, but still it seems to me that our instruction is carried out as if a high regimental figure of merit in individual shooting only, and not battle-firing, was the object in view. Good target-shooting on the ranges is of course necessary before commencing more difficult work at unknown distances, but when once a man has attained a certain proficiency at the range-targets, I think the remaining portion of his annual allowance might be more profitably expended than at present, and an additional number of cartridges given to all for systematic field-firing.

To train a man to shoot properly in the open, a special course of field-firing *instruction*, in addition to range practice, is necessary. At present our field-firing only shows how little we get under the most favourable possible service conditions, after such an immense expenditure on the ranges. Of course as long as regimental figures of merit are published, a good register at the targets, and not battle-shooting, will be the result. Some regiments, particularly in

colonial stations, occasionally make a very high figure; on investigation I think it will be found that these extraordinary scores have been made by never shooting when there was wind or bad weather—about the most unsuitable system as a training for field service that could well be imagined.

The Continental method of judging as to the efficiency of a regiment's firing is very different from ours, and I think very much better. Some of their plans of appearing and disappearing targets for training their men on the ranges are also so simple, and yet so excellent, that it seems a pity they have not been adopted by us. In India and the Colonies, where shooting ground is not difficult to obtain, the Prussian system might certainly be tried.

Aiming and judging distance drill between the annual courses was a move in the right direction, but the way in which it is carried out is generally too perfunctory. Instead of the companies being worked in their regular company squads, the different groups should be arranged according to their proficiency; bad and indifferent shots only should be kept at "wall winking," whereas all soldiers who know how to shoot should go well beyond such elementary drill. Two parties might work against each other, advancing and retiring slowly, the utmost care being given to adjustment of sights and position, the lines to be halted whenever there was the slightest occasion for any special correction. Men who know how to use their rifles naturally soon get sick of poking drill and wall winking, but when men or even animals in motion are given them to aim at, they instantly become interested and keen in what they are doing. By working this system properly, it might be made not only an aiming-drill practice, but also a method of assisting in teaching fire discipline, a subject about which many Officers know next to nothing.

Before quitting this question it may be as well to state that it would be very advisable to teach young Officers on joining how to use a revolver properly; all company Officers should also go through an annual course. At present the only training an Officer in the English Army receives in the use of his weapons is that startling performance which an Inspecting General has to certify he has seen, *viz.*, the sword exercise, apparently the invention of some one who in his younger days must have been deeply impressed with the heroic performances of the British tar on the stage of some transpontine theatre when rescuing his Susan from the minions of Captain Cross-tree. It may be useful to state that it is advisable to get through this curious and slightly dangerous drill before instead of after an inspection lunch. All Officers ought to be able to use their swords, and for that purpose recruit Officers should be taught the proper cuts and guards, and then have regular single-stick exercise.

When young Officers have passed their squad drill and completed their musketry course, the next subject is company drill; but before entrusting them with even a section, a special course of "word of command" drill is very advisable, by placing them round the barrack-square at 50 or 60 yards' interval, and making them pass given orders. Not only does this practice give them confidence in them-

selves, but, when properly taught, it prevents them ever afterwards from falling into that most pernicious habit of giving feeble or hesitating words of command, which is about the most certain method of making well-trained men drill badly. For this reason I consider it advisable to use ropes and as few men as possible when commencing to instruct recruit Officers to command companies; even on my own parade I found it a good plan to halt the battalion instantly if an Officer (no matter of what rank) failed to give a sufficiently sharp decided word of command.

Word of command drill should also, I think, be one of the first exercises for newly appointed non-commissioned officers, who will then have to take charge of small guards and such like.

It may seem that too much importance is given to this drill, but it is really one of the principal factors in producing that steadiness on barrack-square parades which, as has already been stated, is the necessary foundation for battle training. With regard to these barrack-square drills, I may say that I never found it necessary to have more than one Commanding Officer's parade a week, but then everyone understood why these drills were conducted so differently from the tactical exercises, and why the men on these parades were to be automatons, and had to work with the precision of machinery. They also knew that the very slightest movement in the ranks would bring its subsequent result as laid down in the regimental scale of punishment. One Commanding Officer's steady drill per week may in the opinion of some be hardly enough; but when an Adjutant does his own particular duty properly, no imperfectly trained recruit, Officer or soldier, should be allowed to appear on a Commanding Officer's parade.

I may mention that with most of our foreign battalions the men know their drill so thoroughly that they can work on one executive work of command only, without a single Officer or non-commissioned officer to assist; after one or two drills to get them used to the novelty of it, the companies will step off at the right moment and move with the rigidity of red brick walls. Of course this is a very exceptional exercise, but it is an effective test as regards the instruction of the men. With some Officers, who only see the Continental Armies working in apparently loose order at their autumn manœuvres, the machine-like drill of the barrack-square is considered a waste of time; could these Officers be present but one day in the early summer with a Prussian company it is probable their ideas would be somewhat altered. Continental Armies have, however, this advantage over us, *viz.*, that all their drill is organized with one object in view—the battle-field.

But in this comparison with Continentals it must not be overlooked that we have as a rule to fight semi-civilized enemies whose shooting power is limited and who, therefore, trust to a cavalry-like dash with sword and spear. Against such an attack the shoulder-to-shoulder formation is the proper one. For night attacks and night marches the rigid training of the barrack-square is very essential; the importance, therefore, of the steady drill must on no account be overlooked; but when once men are properly trained to it, a comparatively

small weekly allowance of time for such parades is all that is required.

Before leaving the barrack-square, I venture to submit that the drill instruction of Officers and non-commissioned officers should be carried out rather more systematically than it usually is at present. The Adjutant, on his parade with the young Officers, should go steadily through the book; a very few movements each time; the sergeant-major doing the same with the non-commissioned officers, amongst whom every sergeant should be thoroughly at his ease when commanding a company. In the book-work instruction, plain flat pieces of stick to represent sections, companies, &c., with round and square markers for guides and commanders, should always be used by the senior Major at the weekly school; each young Officer placing them in position in addition to giving a verbal explanation.

Passing on to tactical instruction, all I shall have to say with regard to details is, that I think we ought to work more frequently in quarter battalion columns, that is, in double companies, one of which should always be ready to support the other, and when once the double company column has been launched forward by the Officer commanding the battalion, he should interfere with it as little as possible. Majors and Captains ought to be regularly *trained* to rely on their own judgment when reinforcing instead of waiting in the helpless way occasionally observable, or, in desperation, blundering forward recklessly, which would ensure the destruction of those under their command. In criticizing the exercise after the day's work is over it is essential to be careful to avoid saying anything on parade which can be construed into a reflection on the capability of an Officer; that should be reserved for private discussion in the orderly-room, and then encouragement to do better next time and not condemnation will work wonders.

Before quitting the subject of tactical instruction it may be as well to say something about our present system of making work fit in between the regulation breakfast and dinner hours. As regards this last, surely men ought to be trained to work occasionally with bread in their haversacks for a "bite" in the middle of the day, and with full water-bottles, which were not to be used till the bread was eaten; with sharp punishment for any infringement of this order and any attempt to fall out to drink at streams, men soon learn to exercise a little foresight as regards husbanding their supplies; at present, by doing everything for the soldier, and, in fact, treating him almost like a Sunday-school infant out for a picnic, whenever he is taken away from his barracks, we do our best to make him as helpless as a child; and if the sun be particularly hot or the day wet, the parade is cancelled.

Now, endless experience in hot climates has shown that men who are well fed and properly clothed can stand work in the sun, provided it is interesting or money-producing, and be in far better health than when shut up in barracks, sleeping themselves into liver complaints and a thirst which heavy canteen beer alone seems able to quench.

As regards proper feeding, that is really entirely in the hands of the

Commanding Officer, who can raise the daily mess contribution to all that is required for harder work than ordinary parades, and with a General who does not fear that bugbear of superior Officers, viz., "responsibility," a Colonel may be allowed to dress his men in such a way that a long day's interesting tactical work is quite looked forward to by them. I may mention that in Southern Natal, which has a sub-tropical climate, I was permitted, as an experiment, to discard the heavy scarlet kersey for work beyond the barrack-square, using the second grey flannel shirt as a blouse instead; with throats quite exposed and loose shirt sleeves the men were as freely dressed as blue-jackets; the chain and brass ornaments being taken off the white helmet, it then became a light, comfortable headdress fit for the purpose intended. Not only was this grey dress well suited for work, but when put on properly it had a particularly good appearance, and was eventually adopted by all the troops in South Africa when working on the veldt. I may mention that the second loose flannel shirt with air space between the two was found to be a decided protection from the heat of the sun on the back.

It may be said, Why should any deviation be made from the regulation dress? The answer to that is that the thick regulation kersey was, in that climate, unfit for four or five hours' hard work in a hot sun over the Maritzburg hills.

Doubtless in time we shall get a regulation dress for field service, but up to the present it has not been seen; shape, colour, and material have so many different advocates for each. As regards the first, although no Officer would for one instant think of using his town suit for shooting in, some Commanding Officers, for the sake of appearance, sanction the soldier's shooting coat, that is to say, his kersey, being made so tight that when he is in marching order he is about as free to use his limbs as a trussed fowl. The men themselves, if permitted, have also an extraordinary fancy for trousers tight about the knee and wide over the foot, whilst the very opposite should be the case; and as for pockets, anywhere for spare ammunition, &c., such an idea is apparently beyond the pale of consideration.

As regards colour, some Officers see nothing objectionable in bright scarlet for active service. Now, considering how conspicuous red masses are, even at the longest artillery range (and in the present day good practice can be made at 3 miles), it is surely time to reflect whether we are right in making such targets of our men. Prussian Officers have told me that even the dull red trousers of the French in the 1870 Campaign were often very conspicuous and particularly disadvantageous to them. So impressed did these Prussian Officers become for the necessity of diminishing as far as possible anything about their dress which would assist the French in aiming that some regiments blackened the brass work of their helmets. It certainly seems strange that some Officers do not see the disadvantages of bright scarlet; the only solution I can arrive at is that they, without knowing it, are more or less affected with what is known as colour-blindness, and that which to another man is a bright staring colour is to them a dark purple or even a dull neutral tint. On active service,

where suitable stuff for removing perspiration and grease stains cannot be carried, the bright scarlet kersey or serge soon becomes filthy to behold, and yet in the distance the mass of men in scarlet is as distinct a target as ever.

The best dress I have yet seen for field service is that of the mountain batteries in India. As for colour, I think the smartest neutral tint is a reddish-grey formerly worn by a Hertfordshire regiment of volunteers. To part with the time-honoured English red coat would be far too great a wrench, but the difficulty might be got over by every soldier having a scarlet tunic for special parades and for walking out; this tunic to be consigned to the squad-bag and left behind on going into service.

But to return to the subject of the lecture, viz., "battle training." Having now mentioned the principal subjects in which a Commanding Officer can himself instruct his Officers without reference to anyone, it may, in conclusion, be as well to point out how assistance can be given by higher authority.

The absolute necessity for placing every man at the Colonel's disposal for tactical instruction for half a day in each week has already been referred to; now in addition to this positive aid, it has often occurred to me that a Commanding Officer might be materially helped, by taking off his back a good deal of negative work—if I may so term it—such as reducing the clerical work in the orderly-room. One sergeant and two assistants are always writing, and sometimes it is even necessary to add a third, compiling Returns and such like documents called for by every possible authority, and generally in triplicate. Certain quarterly Returns are, of course, necessary for transmission to the Horse Guards, but even these it has often seemed might be diminished in number, and also simplified. As for local Returns, Brigade-Majors and A.A.G's. are, I consider, not a little to blame, they are far too easy in sanctioning the demands of the different departments without thinking of the additional work thrown on the orderly-room clerks and Adjutant who has to check the papers. The Paymasters' and Quartermasters' offices (in both of which two clerks are employed) also contribute their daily supply for the Colonel's perusal and signature.

A move has lately been made in the right direction by simplifying companies' accounts and the Quartermaster's worn-out clothing Returns; surely it is full time some Committee should investigate the necessity for the present absurd amount of orderly-room clerical work. A stringent confidential circular on the subject of local Returns required by Staff and Departments might be a useful commencement.

There are also certain parades or ceremonies which might be modified with advantage, such for instance as that known as "trooping the colours," a weekly performance of which seems rather more than necessary, especially when it requires a General and Staff, and consequently Commanding Officers, to be present. This parade in some stations practically takes away one whole day in each week of the short drill season.

When on this topic I trust I may be pardoned for expressing what many Officers ardently wish for, viz., that we should get back again a flag to take into action instead of the present pair of colours which are presented with much state, and which the Colonel has to declare in a grandiloquent speech will be defended to the last, whilst he knows perfectly well they will be left behind on the regiment going on service. The pair of colours are unquestionably quite unfit for modern warfare, and would entail unnecessary loss of life; but one smaller standard, such as the present Queen's colour, without the fringe and with a shorter pole and smaller crown, would easily roll up, and need not be displayed till the final rush was made: the colour party to be one Officer with a corporal and four men, and its station with the reserve of the battalion. Presented by Royal hands, and the silk kept in repair regimentally, the wood and metal of the colours would last, if need be, for a century; such a standard with the names on the pole of those who might have been killed or wounded when carrying it, would be almost a regimental deity for which every man would gladly give his life. It would indeed be a very different possession from the present fair weather flags which no one can regard with more than official respect.

This digression about colours is rather foreign to the subject of battle training, but not entirely so. I will now, however, finish what I desire to say, by suggesting that those Officers who have special professional knowledge, such as those who have passed the Staff College, and many artillery and engineer Officers, might come forward in large garrisons to give a lecture occasionally to their less well-informed but not less keen brother Officers. Staff College Officers will have several campaigns at their finger ends; surely some of them could give not only very instructive, but extremely interesting lectures; to commence with, the Garrison Instructor might be required to give one such lecture per month during the leave season, or find some capable substitute.

Engineer Officers could give most useful information in showing, for instance, what were the different methods of entrenching positions and posts during the Turco-Russian and Franco-Prussian Wars: an explanation of the various defects and advantages of each would be invaluable to many thoughtful young Officers.

Artillery Officers might explain the mechanism of our new guns, projectiles, and fuzes, and compare ours with those used on the Continent. A detailed account of the effect of different calibres of shells and new explosives on earthworks and buildings would be greedily listened to. Infantry and cavalry Officers in our country, as a rule, know absolutely nothing whatever about artillery fire; now in the present day, this is unquestionably a very serious matter; and in addition to the professional lectures, I think reports of Okehampton field artillery experiments ought to be published for general use; we ought to go even further, and encourage Officers at home to be present at Okehampton during the artillery season, giving special permission for this purpose.

This completes all that I consider I am justified in saying at present

on "the battle training of regimental Officers," but I should like to add that it is very hard on regiments that so many Officers, after being taught their profession, should go to the Indian Staff Corps. Were these Officers supernumeraries from the day they join, there would be no objection; in fact, many Colonels would be only too pleased to receive them on such terms; but to regularly drain off duty Officers, even to one-third of the whole company Officers in one year, is a method of supplying Officers which is doubtless a good bargain for the Indian Government, but it is one which is earned at the expense of the efficiency of the Imperial regiments. Occasionally, letters appear in our leading newspapers, suggesting the four company per battalion system, on the ground that the number of regimental Officers might then be made the same as those on the Continent, viz., sixteen per battalion. Had the writers any practical experience of their subject, they would know that an English Colonel is only too happy if he can, under our present system, ever have such a large number of trained Officers as two per company.

I fear that in touching on the different points bearing on "battle training," I have already made this lecture too long, and I will therefore bring it to an end with a few remarks about the position of a Commanding Officer, on whose shoulders so much is placed, with responsibility and anxieties far exceeding those of any ordinary Staff Officer, and even of some Generals Commanding, and who is worse paid than his own Captains who are employed departmentally; as for table money to assist him (as in the Navy) in entertaining (often a heavy item), he gets absolutely none. When enquiring civilians ask what a Colonel's pay is, many can hardly credit that it is but 18s. a-day and 3s. more when in actual command. Now, all things considered, it would be only right if Colonels were paid the same as Staff Officers of a similar rank; but to carry out this suggestion to its logical conclusion, the command of a regiment would have to be considered as a Staff appointment, and a selection in each case made from a general list of senior Majors.

Note.—The following observations, made during the lecture, do not appear to have been noticed by the shorthand writer: "In speaking of the Officers who come from the militia, I in no way whatever refer to the regular militia Officers, my remarks are solely intended for those young gentlemen who make use of the militia for the purpose of getting into the line."

"Word of command drill."—This is slightly referred to in the Drill Book, page 3, instruction of squads. I need hardly say the system I advocate goes a very long way beyond the paragraph mentioned.

The CHAIRMAN (General Smith): Instead of making remarks at the end of the meeting I will say what I have to say now, in order that I may have the benefit of your opinion upon any points that I may mention with regard to this very interesting lecture. I think Colonel Tulloch was a little hard upon Commanding Officers, when one considers that such a large number of these Officers and Commanding Officers spend their time in garrison towns where there is no opportunity whatever for any field work, and I often wonder that our Commanding Officers and Officers are as good as

they are. The existing arrangements for barracks were made at a time when the conditions of the Service were entirely different from what they are at this moment. The population of the country was then more turbulent, there was no police, there were no railroads and no telegraphs. Surely the time has come when these barracks which often occupy very valuable sites should be sold, and when we should buy tracts of waste country where we could have military camps. As regards the Officers, I am not perfectly certain that I understand what is the great benefit of training Officers at Sandhurst. You send young men from eighteen or nineteen years of age, and you keep them there eight months. At the end of that time they certainly obtain a certain amount of valuable information, but otherwise I should say they had not spent their time so profitably as if instead of going to Sandhurst they had joined their regiments. I think the training of a young Officer is far better conducted in a regiment than in a place like Sandhurst, and I therefore incline to the opinion that we should add to the examination of young Officers who now enter Sandhurst those particular points which they learn at Sandhurst, and we should send them straight to their regiments. With regard to the militia Officers, I fail to understand what is the great object of taking Officers from the militia. It cannot be any great benefit to the militia regiments, because these Officers are taken away from their regiments. Whether it is a back-door for young men who cannot manage to pass examinations I do not know, but if it is I do not think it is for the benefit of the Service. If it is for the benefit of individual Officers, I think it is a false step. The next point I notice is the number of men employed. I have lately had the honour of commanding a brigade at Aldershot, and I perfectly agree that it is heartbreaking, heartbreaking not only for the Commanding Officer of the regiment, but heartbreaking also for the people employing them, because very often there are men employed on very important work. The men are taken away, and the employers have to train ignorant people in important duties which these employed men had to perform. Therefore, it is bad in every way. I should think it would be a capital thing to have a system by which reserve men could be permanently employed. At Aldershot there are men employed in Officers' quarters; there are gardens with ornamental grounds which add to the comforts of the camp, and these might be placed in the hands of men who would be permanently there, and who would take a great interest in them. There are many others: orderlies, men who have to look after the Women's Needlework Association, and all those sort of things, which have not the smallest reference to anything like service, and all these I contend might be well filled by men in the Army Reserve. It would not cost the country very much, and it would have a double advantage, because in time of war you could put your hand on these men, besides the benefit that they would be in their ordinary work. The next memorandum I have made is the report of instruction in the winter. I think Colonel Tulloch is rather hard upon us about these winter reports. I can only say for our work at Aldershot we do exactly what Colonel Tulloch indicates. There is a scheme prepared in the autumn, a certain force is told off for the advanced guard, the enemy is supposed to be in certain places. Then there are four great things at least upon which the Officers are always to report: first, a scheme of outposts; second, the road report; third, the camping ground; and lastly—there may be others—there are the positions upon the line upon which the force could fall back in case of need. That has been done at Aldershot to my certain knowledge for two years. These reports are accompanied by sketches more or less rough; sometimes the greatest praise is given to those most rough, because on examination it is found that they are the most accurate. These have been handed to the Major, and the Major has made his remarks, the Commanding Officer has made his, the General of Brigade has made his, and they have been sent to head-quarters. This system is exactly what Colonel Tulloch thinks should be done, so that I am glad to inform him that it is done and is being done. I am not perfectly certain about the war game model. We have had it at Aldershot, and I dare say for some young Officers it may be a good thing, but I have always thought that maps were the best. The great thing is to learn to work by a map, and every Officer, no matter how young, ought to be made to know what a map is and be obliged to learn to understand it; giving him a model I think is a mistake. The reason, I think, why our friends in the Navy take more interest in their pro-

fession than soldiers is because they have the great advantage of always being on active service. A naval Officer has two enemies, he contends with Nature as well as with his country's enemies. He is always contending with Nature, and that gives a sort of grit to him, which we unfortunate people in the military service cannot get. As regards musketry, nobody more than myself will acknowledge the benefit which Colonel Tongue has rendered to us. The advance in musketry teaching has been very great, but it still partakes too much of the origin of our musketry training. The origin of our musketry training was the Siege of Sebastopol, when the necessity of good individual shooting was very much felt, therefore the great object of the first training of our infantry was to produce good individual shots. The principal object of our musketry training should be to teach men to shoot as required by the drill-book, viz., in masses, sections, or companies, as the case may be; at any rate, the results of our musketry training should be to enable men to go to the field, and act as they are taught to act in the drill-book. For this reason I should do away entirely with the figure of merit based on individual practice, and the figure of merit should be the efficiency of the battalion in field practice. It certainly is very important that men should be good shots, and I should ensure that, by various means by which we could make a man find it worth his while to train himself. The next point is the dinner hour, which is a very favourite topic with me. We were very much hampered by the dinner hour at Aldershot. Whatever we were doing, however interesting it might be, the chances were that we had to go in at one o'clock on account of the dinner hour. I have often argued that it was extremely important to have men used to fast to a certain extent, and not to expect a heavy meal until the end of the day, because certainly in a camp they could very seldom get their heavy meal until the end of the day. As regards the habits of the soldier, that he has been always used to dinner in the middle of the day, I do not think that signifies. In the first instance, it is not so certain that he has been used to a heavy meal in the middle of the day or at any other time, and in the second place, as you train the soldier's mind and train his body, I do not see why you should not train his appetite as well. My last remark is on the colour of the dress. Of course, like most soldiers, I have a great feeling for a red coat. But the arguments are very strong against red, and in many of our campaigns lately we have not dressed our men in red. I do not think after all it is a matter of such very great importance, because of course it does not so very much matter what you put outside, the matter is what you put inside the man. As long as the soldier is trained in the proper way, and has the proper spirit in him, I think it is a matter of comparative indifference how he is dressed.

General Sir C. P. BEAUCHAMP WALKER, K.C.B.: The general tenour of the whole lecture is so good that I hope that a word which Colonel Tulloch used towards the end of it has some meaning in it. They are two words, viz., "at present." I hope he will give us another lecture some day, and an equally good one. The lecture is thoroughly practical, and it points to what really and truly is at the bottom of our success in war, though we do get raps on the head sometimes. I am inclined to say that all drill is battle training. What a man wants in battle is to keep his head cool and his eyes skinned, but he should have so studied his profession that nothing can come strange to him. The great fault which I, after fifty years' service, have found amongst the Officers of the British Army is—I won't say that there is so small a proportion who really make their profession the great object of their life and of their thoughts—but that there is so large a minority who think of the Service as nothing but skittles. It is all very fine wearing a red coat, and it is all very fine having the position in society which the status of an Officer gives him wherever a regiment is quartered: but I wish there was a little more earnestness as to the profession which has been taken up. Men do not take up other professions and treat them with lightness; those who do are unsuccessful in life, absolutely unsuccessful. Then I am afraid there is a thing called a pension at the bottom of an Officer's service, which induces a man sometimes to think, "Oh, when I get out I shall have something to live upon, I shall not starve." I fancy the commercial man who did that would starve. There are two or three points which I should like to advert to. There is one sentence in which I can thoroughly back Colonel Tulloch. After some forty years' service

His Royal Highness was good enough to offer me the post of Director-General of Military Education. Those forty years had been passed almost uninterruptedly on foreign or active service, or on sharpish Staff duties at home. I suppose, therefore, I was looked upon as a person who might be easily impressed with what I had seen very little of, which was soldiering in England. I cannot tell you the mournful stories that were poured into my ear as to the way in which the Officers of the Army had deteriorated in physique since education had been insisted upon. Well, my forty years' service made me rather incredulous as to anything that was told me—in fact, the habit I have formed, after ten more years' service, is to believe nothing—but I still thought it was my business to see whether what was told me was right or wrong. Another thing that was told me was that a totally different class of men was entering the Service from those who entered it when I entered it. I made the most careful inquiries in both respects during my period of office. I saw young Officers as much as possible, the growing ones, whenever they liked to come and see me on any point whatever, and I very soon came to the conclusion that as regards physique there was nothing in the world to be said against those who were entering in that day. And further, as regards status in life, they were exactly the same class of men as entered the Service when I did so forty years earlier. Further than that, having been a keen sportsman all my life, and having formed the same opinion on the subject as is held by the lecturer, I made particular inquiry, both privately and in other ways, as to the sort of men who were coming out strongest at the Staff College. I found that with one exception, during the whole time I was in office, the men who came out at the head of the Staff College list were the hardest riders and the keenest sportsmen among them, and very often the best cricket and racquet players. This I gathered not only from inquiry from the professors, but from those at Sandhurst who were my friends, and had an opportunity of seeing these men, and from the gentlemen who were serving in my office. And I unhesitatingly back the opinion which Colonel Tulloch has laid before you to-day, that the Officers of the Army—I have been four years out of office; they may have become mere bookworms since then, but I do not believe it—that not only there was no fault to be found in the reports I have mentioned as regards those who were the hardest workers, but it also confirmed an opinion of mine, which is, that you may work the body and mind provided you give them both a fair chance. There is no doubt how very right Colonel Tulloch is in speaking of the manner in which regiments are depleted by men being taken away for every species of employment you can conceive. Really the only place where a regiment is worth having is on foreign service, where you have little or nothing of these outside duties. I most entirely and thoroughly agree with him as to the point which he has put forward as to Officers being assembled by their Commanding Officers and, I won't say lectured—everybody hates the name of lecture—but discussions being held on points, and the Commanding Officers explaining to them the reason why, I won't say certain manœuvres, but certain dispositions of the troops, are made. It is a most excellent plan; I have seen it done, and I know how thoroughly well it answers. Having served as Assistant Quartermaster-General in more than one of our districts at home, I can back what Colonel Tulloch has said about the sketches sent in after the marching out days of winter, and I can also say the same thing has occurred to me. I generally found the pretty pictures were the most incorrect, and the roughest sketches were those very often that had the most value. I saw a particular instance of that the other day in the Geographical Society, and that was a series of rough sketches sent home by a gentleman from the Congo, which had no embellishment of any sort or kind, but they were, when looked over, found to be some of the most valuable sketches that had been sent to the Society for a very long time. Colonel Tulloch has also spoken of the comparison between our training of young soldiers and the Prussian. I can only recommend to everybody who is a member of this Institution to look at a paper in the last number of the Journal,¹ which came out two or three days ago, which gives a most admirably careful detail of the manner in which

¹ No. 147, page 255 *et seq.*

every hour, we may say every minute, of the day is utilized in company instruction in Prussia. Experience of hot climates has shown that men who are well fed and properly clothed can stand work in the sun and be in better health than when shut up in barracks. In the very small experience I had of India I passed three weeks of my life on the Nepaul frontier, commanding a small column with which two squadrons of my own regiment were serving. We were out till the first week in June, always on the move, and working a great deal more in the sun than probably would have been recommended if one had been lying in barracks. There were nearly 300 men in the two squadrons, and my whole sick list during that time never exceeded five men, pretty well proving that after all it is not the sun, but it is the beer. I took a very simple method of stopping any extraneous drinks beyond what was served out to them, because in the first village in which I found that drink was being sold I sent a man in to announce that if another pot of drink was sold to any soldier in my column I would kill a cow in the market-place. The result was I never had any more trouble. I beg to bear my humble testimony to the value of Colonel Tulloch's lecture.

Colonel CARDEW, 2nd Battalion South Lancashire Regiment: I should like within the limit of time allowed to touch lightly upon one or two points of Colonel Tulloch's most admirable lecture. I think with regard to the qualifications of Officers entering the Army, that it is very desirable that they should learn surveying and elementary field fortification before entering, because in my experience I have found there is much waste of time in teaching these subjects afterwards. I think we should not be called upon to teach Officers when they are in the Army these theoretical subjects, which they ought to know before they come in. For instance, I have always noticed that the Officers from Sandhurst are much more useful when they are called upon to do reconnaissance sketches and other things connected with that nature of work, because they have had previous instruction. And I would advocate that militia Officers should also, before joining battalions, be sent to certain military schools for the purpose of learning these elementary subjects. With respect to those Officers who have passed through the ranks,¹ I have found the experience gained by them so valuable that I consider such candidates for commissions should be encouraged, but of course before obtaining these commissions they should pass the necessary educational tests, and also a course of surveying and field fortification as other candidates. I think that Officers being struck off duty for garrison classes is a great mistake. Candidates for the Staff College are not so privileged. I know when I came home from India once with one year's leave, and announced my intention to the Adjutant-General to go to the Staff College, my leave was cancelled altogether, and I do not see why Officers who have to pass for promotion should not do it in their leisure time instead of being struck off duty for the purpose. I quite agree with Colonel Tulloch that we have an insufficiency of manœuvring ground, and the few manœuvring grounds we have are not always taken advantage of. Now I come to that other point with regard to the number of men taken off from duties of various kinds. I think more scrutiny should be exercised in detailing working and fatigue parties; too many men are often detailed for such duties. I know I was an offender myself when on the Staff, and did not always consider, as I should have done, the number of men that would be actually necessary for the work in hand. One sometimes sees from six to ten men detailed for the purpose of cleaning out chapels and churches, regimental institutions which I am certain an old charwoman could do much better and more thoroughly. Another thing I deprecate is that so many men should be taken away for engineering works. The soldier of the present day is a far different animal to what he was before; he is now more scientific in every sense; he wants more instruction, and to be carefully trained; therefore his time should not be taken up more than actually necessary by fatigue duties and working parties. In a garrison station I was at not long ago, I found that one quarter of my men were on garrison and regimental employ daily, exclusive of guards and piquets. The consequence was

¹ I refer to sons of gentlemen who, either from want of means or want of application to study, have not been able to pass the examination for a commission.—T. C.

there were very few men at any time on parade. The employment of soldiers on engineering works is a matter for the Treasury, but it seems false economy to use such valuable material as the soldier, whose whole time is required in learning his duties, when such work could be done by men of the Reserve and by civilian labour. The result of employing soldiers is that they are away for weeks and months at a time from their duties, and by the time they come back have forgotten nearly all that they were ever taught. In fact it seems to me that sometimes the infantry are made mere "hewers of wood and drawers of water" for the various Departments of the Service. I do not know whether other Commanding Officers have it in their battalions—I understand it does obtain in some—but I had it in the one I had the honour of commanding, that is the section system carried out in its entirety. I mean by this that system under which the non-commissioned officers and men of a section are always grouped together, not only in barracks but on parade and in the field. It is most important that the non-commissioned officers should not be transferred from their sections except when absolutely necessary. In the battalion I commanded, the sections fell in for parade on their private parade, were inspected by their section commanders, then formed companies and were inspected by the Officers commanding companies. In that way authority was delegated to the lowest rank; the men were always kept together and could work together. But the plan which obtains in garrisons, under which so many men are used for working parties and fatigues, militates against the proper working of the section system. Owing to this cause, sections are frequently represented by only one or two files; often even a company is only so represented, and in rare instances I have even known a battalion to dwindle down to this number. The musketry rosters were kept by sections, so that the men went through their musketry course together; they were never separated, and a proper emulation was encouraged thereby between sections. The duty roster was also carried out by sections, and the men of a section went on duty together; this often enabled the other sections to be kept intact. I think the sections might with advantage be left intact on parade instead of being broken up, as they usually are; for instance, if a company has one or two sections on duty, it might be drilled and manœuvred with the remaining sections, on the same principle as a battalion is drilled, irrespective of the actual number of companies forming it. Colonel Tulloch has informed me that on certain parades he never broke up or equalized the sections, but, no matter how small their strength was, he used them as units. An immense advantage is gained, because you are in a position to give the section commanders practice in fire tactics and discipline, which is so necessary. The system of falling in on parade by sections under the non-commissioned officers does away with the Staff parade, except for the band and the drummers. I think it is an anomaly for the Adjutant to inspect the non-commissioned officers of companies. The Officers commanding companies are the persons responsible for their non-commissioned officers in every respect. By the Queen's Regulations the Commanding Officer is supposed to command on the principal parade of the day, and to ensure that all other parades are commanded by either the second in command or by a field Officer. I think this is a great step in the right direction: I carried it out in my battalion, and in consequence all Adjutant's parades were done away with. I think this is the right principle. The Officers commanding companies should be held responsible for the men in all respects including instruction in drill. I did not find the omission of Adjutant's drills detrimental to the battalion. At first it may have suffered a little in smartness, but by-and-bye, when the Officers found they had thrust on them the responsibility for the efficiency of the men, they rose to the occasion and did very well. The Adjutant performs his legitimate duties, which are those of Staff Officer to the Commanding Officer.

Colonel TONGUE, Commandant, School of Musketry, Hythe: I should like to say a few words with regard to the musketry training. Before doing so I wish to thank Officers and yourself, Sir, most heartily for the very kind manner in which you have borne testimony to the work done by myself and my staff to further the practical teaching of musketry. It is intensely gratifying to us to see that our labours have not been in vain, for of late years I may that musketry instruction generally has had a new birth. That is first of all due to the

Adjutant-General Lord Wolseley, who got us the ammunition, and next to those General Officers and Commanding Officers who have pushed it to the front, and will, I trust, keep it there. I must not forget the Assistant Adjutant who has been appointed within the last year. He has been doing right good work, and I feel sure that what he has been doing for recruits will be felt among the trained soldiers of the battalion. I will first of all touch on the question that Colonel Tulloch raised in connection with the training of recruits at the depots. I may say that I do not think this is quite possible for two reasons. First of all there is no accommodation at the depots, and, again, there is a deficiency of ranges. There are very few depots at which there are suitable ranges to carry out instruction thoroughly. Then, again, at those depots where the instruction is now carried out, it is not so satisfactorily performed as it is in the battalion. I am in a position to tell you this because all the Returns have to come to me, and I know as a matter of fact that it is so. The next point is with regard to the publication of the figures of merit of the range practice being detrimental to field firing. I am afraid I cannot agree with the lecturer on this point, because I think it is very useful publishing the figures of merit. It creates emulation between the battalions and the brigades; besides you must have a figure of merit of some sort to enable the General Officer Commanding to gauge the musketry efficiency of the battalions under him. With regard to publishing a figure of merit for field firing, it is quite impossible because there are so many varying conditions connected with the performance of that most excellent practice as to make it utterly impossible to compare that of one regiment with that of another. There are the dispositions and the number of the dummy figures representing the enemy; then, again, we have the nature of the country over which you operate, and, thirdly, there is the distance, whether short or long, at which the majority of the rounds are fired. All these things would have to be taken into consideration. Then with regard to aiming and judging distance drills. These monthly drills which Colonel Tulloch complains of not being performed properly, I would say are entirely in the hands of Colonels commanding battalions. It is laid down in our very excellent book on musketry instructions that these drills are to be carried out most carefully. Then again he said it was a pity that good shots were not exempted from them. I should like to call attention to the Regulations in which he will see that the Commanding Officer has the power to exempt all marksmen and first-class shots from these drills. The next thing we come to is that all Officers should be put through a course of drill and practice with the Service revolver. I think it is most important that that should be so, and I may say that more than eighteen months ago I strongly recommended this to the Adjutant-General. He quite agreed with my proposition, but there was the money question which cropped up. It would cost 15*l.* only to put every Officer at home and in the Colonies through a course of practice annually with the Service revolver, and the money was refused. I may say with regard to Hythe, and what we do there, that every sergeant and every Officer who goes there—a matter of about 800 every year—is thoroughly instructed in the drill and practice of the Service revolver. That has been going on for the last two years. Now we come to young Officers and sergeants being taught how to give words of command. I entirely agree with Colonel Tulloch that it is of the utmost importance. I established a drill in which every Officer and every sergeant is taught how to convey fire words of command to their sections. I have them formed up in the barrack-square a sufficient distance off, so that they must make themselves heard, and then the instruction goes on. *Everything* depends upon the deliberate manner in which the word of command is given, the emphasis given to the different syllables, the stress laid upon and the pauses made after the preparatory word, and the decision of the final word. The great point after all is with regard to field firing. Upon that I entirely agree with every word that has been said both by Colonel Tulloch and General Smith. I know how much General Smith has interested himself in this matter. I ask him to remember a certain conference held at Aldershot at the invitation of Sir Evelyn Wood not very long ago, in which I think our opinions were entirely in accord. I am quite of opinion that undue importance is given to individual range practice. But we have a book of Regulations, and these Regulations I am afraid we must go by. It is very difficult to upset old traditions. There were many old Officers

who attended that conference who disagreed with me, and I may say disagreed with General Smith, that it was preposterous to think for one moment of reducing the number of rounds in the individual firing and adding them to the field practice. Still, I am entirely of opinion that it should be so. I recommended it to the Adjutant-General some time ago, and I live in hopes of seeing it carried out some day. I look at the individual firing as nothing more nor less than the a, b, c of the thing, it is, in fact, a preparatory practice. It teaches the soldier the sighting of his rifle, its power shows him that if he only holds it straight it will hit, and as a preparation for the more important field practice. To bring the field practice to the front is my aim. I won't say it is the aim of the whole of my staff, for one of them disagrees with me; but at any rate most of them are of that way of thinking. I cannot but respect the opinion of the one dissentient. I have got the thin edge of the wedge in with regard to bringing the field practice to the front, and I am going to push that wedge in as hard as I can.

Colonel Sir LUMLEY GRAHAM, Bart.: Like those who have already spoken, I have great admiration to express for the lecture we have heard. I think it is a most practical and soldier-like lecture, and it not only pleases me on account of what the lecturer said, showing what I think is the very good view he takes of the subject, but it also pleases me in this way, that I see what improvements have been made by our Army of late years, though there are plenty that remain to be made, in the training of Officers. When I think of the days when I joined the Army and of the little training, I may say no training, that Officers got—no battle-training—we only had training in parade work—I see there has been a wonderful change for the better, though it has not yet gone far enough. I think that every word that has been spoken to-day shows that we are on the right road, and that we are fast going towards that perfection which we hope to attain. I cannot see anything in this lecture that I could disagree with. I feel strongly in favour of some of the points that have been urged by Colonel Tulloch, and I have on former occasions spoken about some of them in this hall. There is only one thing that I wish to complain of, and that is about something that Colonel Tulloch has left unsaid, something that a subsequent speaker, Colonel Cardew, alluded to, and that is company-training. I venture to think that Colonel Tulloch rather neglects that. Now it seems to me that company-training is the very foundation of everything that follows; that if your companies are not trained, and above all your company Officers are not trained to what they will have to do in war, it becomes very hard work indeed for the Commanding Officer to train them; in fact, he never will be able to train them properly. I think that this company-training is an all-important thing, and it is recognized as such by the greatest military nation of the day. I know that a difficulty with regard to this company-training arises from the organization of our infantry, and I must express an opinion that I have expressed before, and which I have heard several other Officers express in this theatre, that till we take to the system of strong companies, double companies, in fact permanent double companies, we cannot have that efficient company-training that we hope for. Colonel Cardew spoke very wisely of the necessity of keeping up our sections, what we used to call our squads, and keeping those sections or squads always distinct, both in the barracks, in the field, and on parade. Well, under our present system this is an impossibility with battalions on a low establishment, particularly if they are drawn upon in the way which has been described so vividly, for various outside purposes. If instead of having eight companies in the battalion we have four, at any rate we double the size of our company and of its component parts, and thereby we materially increase the opportunities of our Captains for instructing their companies and for educating themselves as commanders. At the same time I do not wish to do what the lecturer deprecated in referring to this question. I do not wish to reduce the number of Officers. I should not for a moment do that. I say if you have a strong Prussian company, let us have a Major commanding, a Captain second in command, and four subalterns. That is the sort of company I should wish to have, with double the establishment of non-commissioned officers and privates that we have now. I do not wish to economize except by increased efficiency, which is real economy. I will say no more about that. I would just advert to the question of the colour of the clothes which has been alluded to. It appears to me that the excess-

sive visibility of the red coat is not an unmixed evil in war; it is a great thing to be able to distinguish friends from enemies. I, in my little war experience, have seen cases where it was not easy to know which was the enemy and which was the friend. At the Battle of the Alma, particularly, I remember two cases where the General in command of the brigade that I was attached to (I was his Aide-de-Camp) sent me with orders to the Captain of a battery to open fire on a column that was retreating up the hill. I took the order; the Captain said, "Those are not Russians, those are Frenchmen." We had the Frenchmen just on our right; both they and the Russians were dressed in greyish great coats, and at a little distance they were not easily distinguishable from one another. I was sent a second time with the order; "Oh," the Captain repeated, "they are not Russians, they are Frenchmen;" and the column, which was Russians, got away out of range before their identity was established. The same thing happened at the end of the battle when we got on the heights of the Alma after having captured the position. There were the Russian infantry retiring over the plateau, and one of our field batteries galloped up. My General said, "Don't you see those Russians, fire at them." "Oh," says the Captain, "they are Frenchmen." "No," says the General, "they are Russians," and he used rather strong language too. It ended by the same thing happening as before, and the question was not settled till the Russians had got out of range.¹ That was to me a lesson that a distinctive dress is a great advantage in war. With regard to the colour, after all the white pipe-clayed belts and white pouches that we wear and white helmet covers catch the eye more than the red coat. The red coat at a distance is not nearly so visible as the rifleman's green in certain situations.² The last question I will touch upon is with regard to the colours. I feel very strongly what the lecturer said about having one colour restored to battalions in war-time. I think it is a very poor thing indeed depriving the British Army of its colours, as if we were not able to take care of them, were, in fact, afraid of losing them. I think it would have a very bad moral effect, and though I know there have been instances in which colours have brought loss to battalions from the concentration of fire on certain points, yet on the other hand the colours have been the occasion of very valiant deeds, because of the superstition about them which the French call the worship of the colour. It is a superstition if you like, but a superstition which should be kept up as it excites men to great deeds. Therefore, I hope that Colonel Tulloch's idea will be followed, and that one colour will be restored to each battalion on service, at any rate if engaged against the Army of a civilized nation.

Major WALKER, R.E.: It is with very great diffidence indeed that I enter upon any discussion of this paper, but there are some few points that the lecturer has touched upon that I thought that I might allude to. The first point is where the lecturer, after calling attention to the great value of a steady drill, goes on to say something more is necessary, and that we do not get beyond this necessary foundation of steady drill, and he speaks very justly of the want of ground in very many cases for very extended manoeuvres. I think he also draws attention to a point of very great value, and that is that there is a good deal of War Department ground that exists in many places that is not made use of, because it is thrown away by being leased for small sums for farming purposes, and that using that ground for military purposes would cost appreciably nothing to the country, and would be of the greatest advantage to the Service. That is a point that I think ought to be very strongly pressed. Then there is some question of education to which I may fairly allude, for it has been my fortune to have had a good deal to do with education at

¹ A few days later I saw one of our field batteries near Sevastopol, unlimber, and all but open fire upon a body of French troops who were at first mistaken for Russians.

² Years ago, in Kafirland, I had frequent opportunities of comparing the visibility of the red coat with that of the green jacket, and almost always found the latter caught the eye more than the former. This does not, however, apply in the same degree to the *scarlet* tunic now in use, which is more striking than the brickdust-red.

one time and another, and I know something about it. With regard to the special value of the instruction at Sandhurst being its practical nature, I think a little too much has been made of the practical nature of this instruction. I think when you take a lot of young men out and get them to dig at a shelter-trench in such easy soil as Sandhurst they look upon it rather as a lark. I do not think it is a good instruction, although a great deal of time is wasted over it. The practical instruction should come later. I do not think they are quite able to appreciate the value of it. It has been my fate also to know something of what the Officers of the Army know of field fortification later in life, and I find that the men who have had this practical instruction at Sandhurst end, in a very large majority of cases, by not knowing the shelter-trench exercise, showing that it has not made a deep impression upon them. I think that that kind of instruction is very much better given in a model shed. If you have a model shed, as we have at some of our military colleges, where all these things are modelled in sand to about a quarter the full size, the instruction is really very much better. The lecturer has alluded to the militia Officers who have passed the competitive examination, their knowledge being of a most parrot-like description. With that I perfectly agree. The reason is, it is a book examination altogether, and there is a great deal to be said on that point. Our examinations are a great deal too bookish: that is a point to which attention cannot be too much drawn. Then he says, with reference to retired Officers teaching in the School for Militia Officers at Aldershot, "Well qualified retired Officers, who would only be too glad of the employment." But, I think, if you are to have instruction in any branch of the Service you must have Officers in fresh and fresh, and the Officers who are actually in the Service, and have to go back to the Service, are the men who will make the best instructors. I think if you put it in the hands of men who have left the Service it is likely to get into a groove, and not to be quite up to date. The most valuable point, if I may be allowed to give any opinion, in the whole lecture is where the lecturer points out the great value of the Commanding Officer himself pointing out all the mistakes made, and asking the young Officers questions, in fact conducting a tactical instruction. That is a point in which I venture to think that we altogether, or to a very large extent, fail. It is the real point of the whole matter, that unless sufficient interest is taken in the subject of drill, and unless it is made a subject of direct instruction by Commanding Officers, the younger Officers will not take any interest in it. If it is made a subject of direct instruction and inspection, and if it is known that the Officer who pays attention, and who answers well, and shows a knowledge of his profession in these conferences, as some call them, will be brought forward, the feeling of the Officers will change very much about instruction, and they will do what Sir Beauchamp Walker says is so necessary, they will become more professional. What we want is to have professional Officers whose business it is to be soldiers, and whose business it is to fight. There is another point, in which Colonel Tulloch says the Officers should come forward to lecture in garrisons, Officers who have special knowledge of special subjects should come forward and lecture. I think it would be very valuable, but it needs encouragement. If Officers found that instruction was asked for on a special subject, I am sure they would be only too glad to give it, but it is a thing which is, I think, discouraged rather than encouraged. There is another thing, about working in the sun. A very marked illustration of that occurred with respect to the condition of the English and French troops in the West Indies; the Frenchmen worked their troops out in the sun making the roads, we cooped our men up in the barracks; the consequence is, in Martinique they have the most splendid roads of any country, and they were all made by the soldiers, while the British West Indian islands have no roads at all, and the soldiers are very much better in every way if worked in the sun. I can speak from personal experience, having worked hard in the sun years ago in India: it is the healthiest life you can possibly lead in a hot climate to be in the sun if you are working hard. One other subject which I would mention with the deepest humility, is that any reform that is to come in the way of better instruction of the Officers, must come from above, and in this way: I think that if the Officers are to become more professional, if they are to be as Colonel Tulloch wishes, better instructed in their duties as soldiers, apart from parade duties, that can only

be enforced by the inspection being made more real. I had spent a good many years on the Staff as Captain, and I came back to the garrison in England to join a company to pass my examinations for promotion, and during that time I had some inspections, and I venture to think that inspections are not practical in the sense that Colonel Tulloch wants, that what is asked of Officers is not to know their profession, but only its minor details, and until the Officers are asked, and it is the business of the inspecting Officer to see that the Officers do know their profession, so long the result will not be satisfactory.

Major THOMAS, Manchester Regiment : Colonel Tulloch has forcibly called attention to the great evil of withdrawing a great number of soldiers from their legitimate duties and placing them on fatigues. There is another evil of the same nature, though not of so great a magnitude, and that is the withdrawal of Officers from their professional duties to serve on Boards, Committees, and other works which have nothing to do with the duties of a soldier. I have only just come back from India, and there the evil is one of very great proportions. The number of days that Officers in India are taken away from their parades and other works to sit on Boards and Committees is very great ; I myself have been on Committees of all sorts, on subjects which I really could not be expected to know anything about. Not long ago I was ordered to be President of a Committee to decide on the quality of a carpet ordered for the Viceroy's Camp. It was the duty of the ordnance Officer to provide these things : an Officer of artillery objected to the quality of the carpet. I went up and said, "My education in aesthetics has been sadly neglected : I can only promise to be a judge of fact, and not of the quality of this carpet." There was a dispute as to the colours, whether they were too bright or too subdued. That is one instance of the way in which we are taken away from our proper work, and a great deal of that sort of thing occurs in India. Another point referred to is that of judging distances. I speak with great deference on this matter, as there is present here to-day the Head of the Musketry School ; but it strikes me at the present day that with the very flat trajectory of the rifle judging distances is almost unnecessary, and certainly the time now wasted upon that might be saved for other instruction. I think it is only necessary that Officers and non-commissioned officers should know and be taught to judge distances, especially as in action we are told we should always inform the men at what range they are supposed to be firing, so that perhaps judging distances in the future will be unnecessary for the great mass of the Army. With regard to revolver practice, apparently the lecturer does not know that in India for the last two years all infantry Officers have been compelled to go through a course of revolver practice. The money difficulty has been got over by an order from the Commander-in-Chief, directing us to pay for the ammunition ourselves, but as the cost is very small there is no objection on that account. The first practice I attended I looked upon as one involving a considerable amount of danger. Officers produce all sorts and conditions of weapons, and it would be a good plan if we were all obliged to have one of the same pattern.

Captain WALTER ADYE, Royal Irish Rifles : I wish to make a few remarks with regard to the actual field training of our Officers and men. It has been referred to by several distinguished Officers, and amongst them the late Director-General of Military Education. I want first of all, with regard to the training of Officers and men, to refer to one of the most important remarks made this evening, I think by Major Walker, Royal Engineers, and that is as to the system of inspection. In our practical training there are three important factors which require careful attention and simplification. Those three factors are, first of all that the training of men and Officers should be guided by that leading principle of fixing the responsibility. I think it was especially referred to by Colonel Cardew, and also by Sir Lumley Graham, that the company should be not only a fighting unit but a school unit, where the entire training of the man should be carried out ; but somebody, be it Captain or subaltern, should be wholly and entirely responsible for it, and his future career should largely depend on the result he produces. The next point with regard to the training of men and Officers, not only for the sake of the responsibility for the efficient battle training of the men, but also of the recruits in the regiment who come from the dépôt ; there seems to be a sort of dual control, and the standard of efficiency is not defined. When I was in my regiment—I have

been seconded in my regiment for the last four years—but when I was with my regiment, and was for some years commanding a company as a subaltern, I found the greatest difficulty in ascertaining who was responsible for the proper training of recruits. There was no fixed quantity or standard of efficiency laid down; they all came there with various documents and Returns, but it was never understood what point they had reached in their field training; one always knew what they had done in musketry, but no one knew how far they had got in battle or field training. That was one of the greatest difficulties we experienced as subaltern Officers, when these men came to the battalion and were handed over to the company from the Adjutant. There is no school recognized either in the company, or in the battalion, or at the dépôt, and the question comes, who is responsible for the recruits' progressive training? Then there is another point which has been referred to, namely, the system of inspection. Of course inspection solely and entirely regulates the practice. As Major Walker said, the whole practical, theoretical instruction of Officers and men entirely depends on the nature of the inspection; whether he be a man or an Officer, he is guided in his energy, or his zeal, or his apathy, as the case may be, by what he expects to have to do at the inspection. The Officer is always working up for inspection, and when inspection arrives he finds nothing more nor less than a test in the elementary part of training, or a great deal of it (not in every case), but at inspection he finds he is examined in nothing else, but simply company and barrack-square drill. I think that is a great point to bear in mind. Colonel Tulloch said a great deal with regard to the examination of militia Officers, and also Officers of the regulars, for promotion. I should like to say one word with regard to the examination of Officers in the Army for promotion. I think the tactical and other theoretical papers in fortification and topography should be not only far more simplified, but be made a far more practical test of a man's knowledge than they are. With regard to tactics, it would be more satisfactory, and far more practical, if an Officer were set a few simple problems which had to be worked out on a map, instead of being asked ten or twenty questions based on a text-book. Anybody can get hold of a tactical book, all he has to do is to commit to memory something like fifty or sixty different rules; he can do that in the course of a few hours, and after that he can pass almost any examination paper put before him, but that is no practical test whatever. One thing regarding a point indicated by Colonel Lonsdale Hale, when he gave, a few weeks ago, a lecture here on "The German Drill Regulations." He was telling us that in his time, when he was Garrison Instructor, and subsequently the examiner to set the papers for Officers' examinations, he had the easiest possible task to pluck any Officer by giving him general questions. All Officers could answer rule of thumb questions, but few could apply general principles to any given combination of circumstances.¹

Brigadier-General the Right Hon. J. H. MACDONALD, C.B.: Mr. Chairman, ladies and gentlemen, as an Officer of volunteers, I have listened with as great satisfaction, if not greater, than that with which any Army Officer can have listened to the instructive lecture we have had from Colonel Tulloch. There are one or two

¹ The well-known "Letters on Artillery, Infantry, and Cavalry," translated from the German by Colonel Walford, R.A., give an excellent idea of the method of effectively inspecting a body of Officers and men in battle training. In the drill examination of Officers which precedes the paper test, the same unpractical method is noticed. Officers are examined in extended order movements, advanced guards, outposts, &c., but, in nine cases out of ten, the test is carried out with a handful of men in the confined limits of a barrack-square. Yet the certificates given represent the successful candidates as being capable of leading men in the field. As regards musketry training, the inspections might with advantage be made more searching. What is wanted is a good all-round average in the field or military shooting. The word "score" has been considered the objective, instead of the word "war." Once a man has been well grounded in the use and knowledge of his rifle by steady shooting at a fixed target and known distances, he should then be practised in nothing but field practices under military conditions, and frequently accounted in a complete Service kit.—W. A.

points on which I should like to say a few words from a volunteer point of view. If the battle training of Officers is to be efficient, the first step you must take is to find out what it is you are going to make them do with their men, and how the men are to be organized. It seems to me that several matters must be dealt with in that view: first, you must carry out the reform which Colonel Cardew has suggested, viz., the reduction of the unit, making it a real unit for work. You may give Officers any instructions you please, but they will never be able under present arrangements to carry them out. With the system that you now have of organization for battle, it is absolutely essential that there should be individual action controlled by grouping. I think it is absolutely necessary that you should organize down, even lower than a section, into groups, which shall be small groups consisting of a fixed number of men, and not a large uncertain group, like sections, which may vary one day with another in the same regiment, and vary with the strength of the regiment, because your section one day may be twenty-four men, and another day it may be only eighteen men. Working by sections you do not get a working group at all, because a working group should consist of an exact and unchanging number of men at all times. And the group ought not to be, as the section is, a practically separate command, but only a few men who are under the charge of one of their number who has not to command the men, but to aid them in working out the command of the superior. He has to see that this group as a part of the organization of a section or company should be as far as possible prevented from losing itself, and the men prevented from falling out of their connectedness and getting into confusion. Until we recognize that principle, I think every Commanding Officer will feel that he cannot launch his men, even in peace-time, over a rough, broken, or wood-covered piece of ground without being subjected to the unfair criticism upon their drill and discipline of persons who are looking on, both professional and others. For it is only by having some such grouping system that you can ever carry out rapid, organized advance, and rally quickly from the confusion of the climax into the safety of orderly form. Then there is another matter, which I think is of the greatest possible importance, which is, that in training we should not perpetually follow the system of wearily grinding at one thing for a considerable time, and then dropping that altogether and beginning to train at something else, but that the instruction of a man who enters the Army or the volunteers should be like the training for every other practical or educational work in this world. After he has had sufficient preliminary drill to know how to move about, this instruction should be interspersed, that is to say, his parade or stiff-style instruction and his what may be called *action* or free-style instruction, should be made to dovetail into one another. The parade stiffness of form and dressing should be used as the best means of rallying out of the necessary loss of exact form which will occur in proper action instruction. The men should feel that the parade training, which should of course be careful and accurate, is only to lead up to the action training, in which the mere accuracy of external form is made subordinate, and the real work—for which the parade was a preparation—is entered upon. The action training will then not be a distracting and disturbing exercise, but will be consistent with the fact that the men must be kept in order on all occasions when they are engaged in the field, and recovered into form as soon as possible when the unavoidable loss of form in action exercise has occurred. I am quite sure that if you could establish the principle that during every drill the men should be alternately taken from parade drill to action drill, and from action drill back to parade drill, at intervals of say twenty minutes, the men would be more interested in both drills, and you would have extraordinary power of restoring them from confusion to order, rallying them from the shakiness which is induced by their being compelled to go on rough ground and being exercised in a rougher manner. You would have much more power than you have according to the system which has been followed in my experience in this country for a great many years. At present men are kept for months and months performing figures in barrack-yards, and are then carried off to some place where there is a considerable amount of broken ground. Parade work ceases, and a separate system begins. If in contrast to this you were to adopt a system of training in which both styles were combined, you would not hear again that extraordinary observation made so often by Army Officers when men are taken out for practical exercise at Aldershot or

Salisbury Plain, and which I have over and over again heard myself, that it would take them six weeks to get the men brought back to a state of discipline after the way in which they had been knocked about in field work. There must be something seriously wrong in system, if the practical application of instruction strikes a blow at discipline. There is one other matter to which I should like to refer, and that is this, that all our drill-shed or barrack-yard drill, all our drill with markers out, dressing on points, &c., seems to me never to have any relation whatever to the business to which all drill should apply, particularly in modern times, that is to train men into that second nature which shall enable them to use their weapons to the best effect. I look upon it now as an essential part of fire discipline that men should never be got out with arms in their hands on parade *on any occasion* without its being part of the business of the day that their Officers and sergeants should during their hours of drill repeatedly and over and over again put them through the motions of firing by order. Habit is a powerful thing, and when men have been accustomed to bring their rifles to the shoulder, after adjusting the sights according to order, and take steady aim, if they have done that thousands and thousands of times, they will certainly be steadier men when they come to do it under the more exciting circumstances of an engagement, than if it has been entirely ignored at drill. What is the fact? I am under the correction of the military Officers here when I ask if such a thing is ever done in barrack-yard drill. I will give you an instance. I went to the Wellington Barracks for the purpose of learning what I ought to teach my men, and how to teach them. During the whole time I was there on no single occasion were we directed to put those under the command through the motions of firing at all. It seems to me that is just simply turning the barrack-yard into a place in which Officers are to learn how to move men about, and how to make them stand in an exactly straight line, but it does not impress upon the mind of the Officer the importance of seeing that his men shall be put through the motions of firing in a disciplined manner, and taught, by the habit of perpetually doing so, to fire in a disciplined manner. If there was a strict order issued that on no occasion were men to be drilled with arms in their hands without their being from time to time brought to the firing position and put through the motions of firing correctly, it would be of the greatest possible benefit to fire discipline. One word about inspection. The volunteers have always felt what has been stated in this theatre on many occasions, and expressed again to-day, that it is the inspection which settles what the previous drill will be. I know myself during the last year, having had the honour of being appointed Commander of a brigade in my own country, that on more than one occasion when I have asked a Colonel whether he would not give up practising the march past, saluting and so on, and devote more time to action exercises, I have been told, "Oh, Sir, when the Inspecting Officer comes round he will expect us to begin with march past in column, and all our Officers to salute very correctly, and if we do not practise this we shall not get our Capitation Grant."¹ In my own particular case with my own regiment, we this year escaped from this bugbear. We were inspected last Saturday, and on that occasion our inspection consisted of our receiving the Inspecting Officer. The whole brigade consisting of three battalions was then put through the attack, every Officer who had duty to do being called upon to describe to his men what he wanted to do and how it was to be carried out. At the end of that practical piece of work we marched past once in quarter-column at the trail, and that was our whole inspection—the first practical inspection I had ever gone through since I became a volunteer.

¹ This question of inspection is at the root of the whole matter. No greater mistake was ever made than the reintroduction of the salute by Officers in front of their companies in the march past, after march past in slow time was abolished. This necessarily results in a large amount of time being wasted in marching past the men in order to practise the Officers in saluting. The marching past should be restricted to one march in column or quarter-column, according to circumstances, that the Inspecting Officer may see the men. All beyond this is a waste of time under modern conditions, and leads to great waste of time in preparation.—J. H. A. M.

I am most grateful to our Officer commanding the regimental district for allowing such an inspection, and I earnestly hope his example will be followed.

Lieutenant-Colonel HERBERT (Grenadier Guards), Military Attaché in St. Petersburg: I will not delay you beyond a very few minutes, but I wish to say a few words drawn from my recent experiences in Russia in support of what has been said by several speakers, that everything in the training of the soldier is dependent on the inspection. I happened to be travelling with a Russian General a short time ago, who was making a tour of inspection. We arrived in the evening at a station where the train stopped for dinner, and in the neighbouring town was quartered a regiment which my friend had to inspect. When we got there the first person we saw was the Colonel commanding the regiment. The General seemed annoyed, and said to me, making use of a very strong expression, "Now he knows I am about here, my little plans will have to be altered."³³ He explained to me that he did not wish it ever to be known when he was coming to inspect. We got into the train again and continued our journey. About a week afterwards the General came back to the same place, arriving about three in the morning. Then he started off and ordered out a company of that regiment for practical work in the field. They were paraded within an hour after the time he arrived. There is perhaps more necessity in that country for keeping one's movements entirely secret than in England, but there is no doubt it is an extremely practical way of testing the efficiency of troops. There is no chance of "*getting up*" anything beforehand, none of the swabbing of barrack-rooms, and getting things all in order, the best clothes out, and all the rest of it: the men were taken out straight away and put through the most complete tests of their battle training. Of course there is a difficulty arising in this country with regard to the quarters of the troops. We know that here practical work cannot be done very often; there is no ground available where a General can put troops to a proper test in that way, but still I think something might be done in the way of separating the inspection of troops with regard to their training, from the inspection on parade, the inspection of barracks, and interior economy, and other things which are no doubt extremely necessary for efficiency. I felt called upon when General Macdonald was speaking, to get up in defence of an institution which he attacked, though I believe very good-naturedly, that is, the School of Instruction for Reserve Forces at Wellington Barracks, with which I was formerly connected. There I say the fault that he complains of, if it be a fault, is exactly the same in origin as that already alluded to. We work there—I speak as an ex-Commandant of that School—we work there for the test required from the volunteers. We do not want to train our men: they are already perfectly trained. The men are brought out simply as machines to be operated upon by a lot of Officers, who have to learn up a certain amount of drill. We did our best to teach them what they would have to do when they came to be examined. I fully agree with many of General Macdonald's remarks, and merely wish to make this statement in defence of the efficiency of that School, and I think most volunteer Officers who have been there will bear me out in saying that it is efficient.

General MACDONALD: I did not wish to attack the efficiency of the School; all that I objected to was that volunteer Officers should never be instructed to put the men through the motions of firing when they had them on parade, and thereby be led to think that firing exercise was of no consequence.

Colonel TULLOCH (in reply): With regard to Sandhurst and discipline, I have not found any difficulty amongst young Officers at all. Some had a few odd ideas when they first came, but they got rid of most of them after being there for forty-eight hours, and there were none who were not in perfect order after a week's regimental life. With regard to reading maps, I think that should certainly be taught as part of a surveying course, but I cannot help saying how much I think the raised model teaches Officers to read *ground*. The first place in which I ever saw Colonel Shaw's invention was in Cairo, and there Officers of all grades took the keenest interest in the War Game. I am sure everyone of us, no matter what our experience had been, got much instruction by simply writing out the orders. I beg sincerely to thank Sir Beauchamp Walker for the very eulogistic way in which he was kind enough to speak of the lecture. It will encourage one to do more by-and-by. Colonel Cardew mentioned about sections and my having worked on the squadrons.

or section system in my own regiment. I had the whole of the regulations for that printed and placed in the hands of every non-commissioned officer. That little pamphlet is now amongst the miscellaneous pamphlets in the library of the Institution. I also had the same thing done when I was in command of a brigade so that everyone should know exactly what I wanted. As regards the figure of merit for musketry, I certainly think we might raise to a higher standard the value of a low percentage of third-class shots. I think the effective shooting of a battalion should to a great extent be measured by the small number of men who shoot badly. In South Africa, where my men took to shooting in a most extraordinary way, paying for their own ammunition, we found there were only 5 per cent. of the whole regiment who could not be taught to shoot, and that 5 per cent. I think had defective vision. But I know this, that our field or rather battle firing exercises were so remarkable that the Boers used to come down and could hardly believe what they saw. On one occasion one of the mounted infantry subalterns with his orderly came across a party of Boers beyond the Tugela going to their new Republic. They began talking and chaffing, and just then a buck happened to turn up on the veldt. These Boers said, "Look at that buck, you say you can shoot, knock it over." The orderly got off his horse, judged the distance, went on his knee, fired, and the buck fell. The Boers would not believe the buck had been hit till they rode up to the body. When they measured this distance, it was 500 yards. The other day at Assouan, where we had two Morris tubes with which shots were occasionally got at foxes, on one occasion a man fired at a fox as it was trotting off; he missed it with the first shot, put in another cartridge, and shot the fox through the head dead at 200 yards. These were the men who had been taught in South Africa. As regards the field firing having a figure of merit, I believe the Germans have that test, and I see no reason why we should not also have the same. With reference to the revolver, I found no difficulty in making a revolver range in Kasr el Nil Barracks; revolver practice was carried out and also exercise with the Morris tube for the benefit of bad shots amongst the men. Of course the revolver practice was under very stringent regulations, because I do not know a more dangerous animal than a young gentleman when he first takes a revolver in his hand. Sir Lumley Graham was kind enough to refer to the company being the unit. I should like very much to go into that question, because I have very strong ideas upon the subject, but as the lecture has been far too long, I dare not say any more. All I can say is with regard to the section, or squad as I prefer to call it, I always made that the tactical unit and worked it much in the same way that a gun and its detachment is worked in a battery. Living together, as the men of each squad did, they knew each other well, and would stick together under the most trying circumstances. In their barrack-rooms the men of each squad were posted up with the squad leaders, that is to say, sergeant, corporal, lance-corporal, and an old private, and at every tactical parade these men fell out in front of the squad, so that the men who were to be their leaders were impressed on them, that if the first squad leader was shot down the second was ready to take his place. Practically there were sixteen squad leaders in each company. On tactical parades each squad of a company fell in by itself, there was no equalization of members. As to the red coat: in distinguishing the other side I was very nearly coming into a collision on one occasion with our own Indian cavalry, from the enemy's dress being similar in colour to that. But one must take one's chance: in fact, on one occasion I know some sailors were very nearly firing into the marines. It was pointed out to them that they were not the enemy, some of my old shipmates rather wanted to have a shot all the same for the fun of the thing. As regards red not being a conspicuous colour or thing, why is it that in target practice the danger signal is a red flag? Because it catches the eye instantly. On the railway, red is also the danger signal for the same reason. Then, take for instance an ordinary hunt in England, look over the hunting-field, the eye catches instantly the red figures, long before even the black coats can be seen. As regards the belts, they always take the pipe-clay off them now on service; my own men the other day at Suakin had the whole of the pipe-clay washed off and the belts stained, and they really were not noticeable at all. I am very delighted to hear Major Walker support me with reference to the War Game, as regards the course at Sandhurst not being practical enough. Surely that is in the hands of the

Education Department, they should know all that is going on. All I can say is as to those men I have had from Sandhurst, they had been well taught. I used to give all the Officers regular schemes, just as is done at the Staff College, and they worked out some of those schemes in a way that would have done credit to men in the Staff College itself.

Major WALKER: I may say I have nothing to do with the Education Department. Somebody accused me of it.

Colonel TULLOCH: I certainly think they might have more practical work, and I said so in my paper.

Major WALKER: I have a connection with it: I do not belong to it.

Colonel TULLOCH: As regards what Major Thomas has said about the revolver. I may say that we bought our own ammunition in Egypt: it was not much—some small sum. I found it answer quite well; we had a good range, close to the mess room. With regard to what has been said about working up for inspection. I am afraid we all of us know that that is so. The Russian method as explained by Colonel Herbert is the proper system. As regards what Brigadier-General Macdonald has said with reference to the drill, all I can say is that it is a most intense feeling of satisfaction to an old soldier to find that the volunteers are so keen about training. I know I had a great deal to do with them in entraining and detraining troops at several big Easter Monday Reviews, and everything which the volunteers had to do did them very great credit. Their very discipline is now something marvellous. On one occasion I remember being in charge of a large station at Brighton. The men had been at work all day without refreshment, there were long refreshment bars on the platforms. The volunteers marched in. I stood well clear to see what would happen. They looked with hungry eyes on the provisions, but the whole body marched steadily up to the train. We found there was five minutes to spare, and I told the Colonel they might fall out: instantly they went at the food, like hungry wolves. When required to fall in they were all back in their places instantly. These men had not had anything since seven o'clock in the morning; when they arrived at the station it was six o'clock in the evening: the discipline of those men was I consider excellent. I had on another occasion six regiments waiting for trains coming up. The railway people had not brought them up in proper time. The men were told to sit down quiet, three regiments on one side of the long platform and six on the other, and I assure you, if a blind man had walked up that platform, with those six battalions sitting on each side, he could not have known there was a single man there, so quiet were they all. I have heard others say the same sort of thing. Then again, the keen way in which the volunteer Officers work at drill fairly startles one. It is a great satisfaction for us to see the way in which those Officers have taken to studying their volunteer profession. I do not think that I have anything more to say, except as regards what Colonel Herbert has said with regard to battle training inspection and mere parade inspection being kept separate. I think if Generals did come suddenly down upon a regiment in the present day many Commanding Officers would be only too happy to show they were always ready, but others again might prefer the present method.

The CHAIRMAN: I have on your behalf to return our thanks to Colonel Tulloch for his admirable lecture.

Friday, May 17, 1889.

ADMIRAL OF THE FLEET THE HON. SIR HENRY KEPPEL, G.C.B.,
Vice-Patron, in the Chair.

ON THE TRAINING OF THE EXECUTIVE BRANCH OF THE NAVY.

By Captain GERARD H. NOEL, R.N.

1. General Considerations.

THERE is a natural feeling in the Navy that naval Officers should have a voice in the decision of the types of vessels they may be some day called upon to take into action, and there is so much controversy on this subject that the still graver question of the training of Officers and men to man and fight these ships is allowed to fall into the background. The answer of an Admiral who had full confidence that those under his command were thoroughly trained to a sea life as men-of-war's-men would be: "Give us any sort of vessels, so long as they are seaworthy, and we will fight them;" in fact the training and efficiency of the personnel should be the naval Officers' first and principal care.

In September, 1885, four corvettes were commissioned for the Training Squadron, the purpose of which is to train young Officers and seamen in the practical duties of men-of-war's men at sea. In former years similar squadrons of exercise, under the less expressive but more poetical title of "Flying Squadrons," have been periodically organized and kept cruizing, not, perhaps, so much with a view to the training of young seamen as to the employment of Officers and men in time of peace. The existence of these squadrons came to an end in the summer of 1882, and by many Officers it was regretfully supposed that the Navy had seen the last of them. But the Boards of Admiralty under the present Government, with wise foreknowledge of the absolute necessity for retaining in the seamen of the Fleet the attributes of a sailor, and that experience of sea-life, without which a man-of-war's man is of little practical value, determined to re-establish the squadron on a more effective system; hence the formation of the present Training Squadron.

The advocates for the abolition of all that was formerly known as seamanship, who would sweep away every stitch of canvas, and every spar that was not required for military purposes, were not pleased

with what they considered the retrograde step of re-introducing a system of training men as sailors; and so confident were some of them that seamanship was a thing of the past, that they were inclined to shut their ears to all arguments in opposition to their favourite theories, and to console themselves that such opposition must soon die a natural death. It is partly in the hope of awakening in these Officers a sense of the real situation, and of conveying to whoever may hear this paper a view of the other side of the question (for so often the condemnation of everything that is not machinery is dinned into the ears of the public), that this paper is humbly submitted for consideration.

Supposing, as it is here asserted, that the first care of a naval Officer should be the efficient training of the personnel of the Navy, let us consider how it is best carried into effect, and in doing this it is proposed to treat only of the Executive, and not to refer to the Civil departments, all of which, including that most important branch, the Engineers and stokers, are composed of specialists, only differing from their comrades in other employ through being subjected to a more rigorous discipline, and in most cases entrusted with greater responsibilities.

We have to train the naval Executive in such a manner as to make him in the highest degree capable as a man-of-war's man; how is this to be done? First, let us imagine what his duties would be in time of war.

In a naval war our ships would be constantly at sea, probably only putting into harbour for repairs or coaling. They will be frequently damaged through action with the enemy, collision, or grounding; losing anchors, davits, boats, and spars, all of which should be, as far as possible, immediately, though, perhaps, temporarily, replaced. They will frequently have to send away boats on various services, and, let us hope occasionally, parties as prize crews. Coaling, often under great difficulties and with the greatest possible celerity, will be a constant necessity. They will occasionally fight in a general or an individual action; and sometimes (when there is no danger to the ship itself) they will be required to land all available men for service ashore. They will often have to take other ships in tow, or render them assistance. Away from naval ports the Executive will have to improvise methods of removing disabled guns and replacing them with others, for the transport of heavy boats, and for innumerable minor duties with regard to the supplies required for the Fleet, all of which will have to be done with the utmost speed.

In order to accomplish these duties effectively, the general ideas for the training of the Executive may be summed up as follows:— Officers and men should be entered young (this has now been done for many years); Officers and men should have the maximum of sea experience; Officers should be constantly in charge of men, and giving orders to them, and the men should know how to obey any order they receive with alacrity; skill in handling men should be attained by the Officers, smartness and handiness be attained by the men; acute vigilance should be practised by both Officers and men,

and the power of detecting the least sign of anything going wrong; accurate observation, especially as to the appearance and movements of other ships, should be cultivated; an intelligent comprehension of what dangers are to be apprehended, and the best means of warding them off, is invaluable; a general readiness of resource, which can only be gained by experience, is most desirable; activity and fearlessness are indispensable. Thorough efficiency in boats, and on the part of the Officers in the management of their ships, is essential; and last, but not least, a thorough knowledge of the use of arms, and for the Officers in addition, a proficiency in commanding batteries, or parties of men under arms, is of very great importance, training for which should commence from the earliest entry.

Having thus sketched the principal attributes which the Executive should possess, it is proposed in this paper to point out that without the use of masted ships the requisite training is unattainable.

2. *Entry and Training.*

The present system of the entry of cadets and training of young Officers is satisfactory so long as the youngsters are kept up to the mark in sea-going ships. The tendency to make too much of school-work at the expense of other more important matters is to be regretted. Boat work and close attention to the duties of the ship—giving the boys responsibilities from which they gain self-reliance—and such training as will fit them eventually for the important duties of command, and those of executive Officer, should never be disregarded; navigating and signal duties, &c., should be closely attended to—in fact, the three years of a midshipman's service before passing for Lieutenant should be more devoted to learning his duty as an Officer than to anything else. At present, by a wise provision, the last year or six months of this time is usually passed in the Training Squadron. More elaborate instruction in steam, and actual work in the engine-room and stoke-hold, have recently been ordered for young Officers; this, no doubt, will have a beneficial effect, both in giving the Executive a better knowledge of machinery, and in rendering them more capable of some day commanding vessels in which perhaps one-third of the crew will belong to the engine-room department; but it must not be supposed that the Executives are required to become Engineers, any more than that the Engineers are required to become Executives; both have their clearly defined and separate duties. Such is the amount of machinery now put into ships that it is increasingly necessary that the Executive should be trained to its use, and for the same reason it is more than ever important that mathematics should be the most prominent part of a naval Officer's education. All seamanship is associated with the working and utilizing of forces, and may be termed mathematical; it generates in the student the principles of applied mathematics, so that whatever is the source of power, a well-trained seaman soon adapts himself to its proper and most effective use.

Lieutenants when first promoted (especially those who earn early

promotion by doing well at their examinations), are, after their long periods of instruction at Greenwich and Portsmouth, usually very deficient in sea-going knowledge; the sooner this is rectified by appointing them for service at sea the better, and it is not advisable to allow them to take up one of the special branches until they have shown themselves thoroughly capable as Officers of the watch. Of these special branches, such as gunnery, torpedo, and surveying, only a few words are needed. It is certainly necessary that a select few who show great aptitude for scientific pursuits should have every opportunity and encouragement in becoming experts in their special line, so that they may eventually fit themselves for filling the positions of the highest authorities on these matters. Apart from this staff of specialists, all other executive Officers should be more or less trained alike, their courses of gunnery and torpedo work should qualify them to perform the necessary duties on board a commissioned ship, and every Officer should be well acquainted with the duty of navigating, although in this last branch the aptest should be selected for the more important appointments.

No one doubts for a moment that it is desirable that our Service should produce men of highly scientific qualifications in the gunnery, torpedo, and surveying branches; but whatever may be their other merits, the most valuable men in time of war will be those who can best command, handle, and fight their ships, in fact, the best seamen—the aim of all training of the Executive should be to this end.

The Captain who will best handle the ship of the present day, and fight her with success, will be one who possesses the maximum of sea-going experience, the power to command, and a clear-sighted understanding of his means of propulsion and his powers of offence and defence. Sea-going experience, and power of command, are only gained by a life's study, the other items are mastered by carefully following the ever-changing systems of the day, being familiar with the nature and direction in which progress is likely to be made, so that when once in commission he can readily understand the peculiarities of his vessel.

The entry of seamen as boys, and their first training in drill-ships and brigs, is all that can be desired; from the drill-ships boys are now drafted to the Training Squadron, in which they serve until the age of eighteen (when they are rated ordinary seamen), and to which some return later on to serve another six months as ordinary seamen. This last period is not always carried out, partly because the present Training Squadron cannot accommodate sufficient numbers, and partly in consequence of the men's services being required in other ships; but this training so far as it goes is most beneficial. From the age of eighteen men engage to serve twelve years; the smartest of them qualify for A.B. at about the age of nineteen, and the others with few exceptions before they are twenty-one. It would be a great benefit to the Service if these three years (viz., from eighteen to twenty-one) were passed in masted ships at sea, with this exception, that those who have obtained the rating of A.B. under the three years should be allowed to qualify in gunnery in one of the home gunnery

ships out of that time; but until they have had three years' man's time in masted ships—that is chiefly in the Training or Channel Squadrons—it would be well to consider them as not eligible for home service or mastless ships. Having acquired this amount of sea-going experience, they would yet have between eight and nine years to complete their first period of service, and from the time of completing the first three years' sea-time, all (with the exception of those few required to fill the higher ratings in masted ships) would be available for manning the more modern types of vessels; the least intelligent as man-of-war's men being employed in troop-ships.

The greater part of practical torpedo work is closely allied to a seaman's ordinary duty, and there is no reason why the splicing and fitting of electric cables, the working of torpedo nets, and indeed everything except the handling of explosives, should not be introduced into the earlier part of seamanship training. Gun, rifle, and cutlass drills are all part of the training routine, and as the Channel and Training Squadrons are composed of fully equipped war-ships, the necessary amount of these drills is carried out, so that even the youngest seaman is not strange to the weapons with which he may have to fight.

It has also been suggested that the crews of some of the Channel ships should be occasionally turned over to the mastless battle-ships and cruisers, which are in readiness at the home ports, for a few weeks' training in the summer months.

After the period of sea-going training referred to above, the seaman should be in all respects able-bodied; he is twenty-one years of age, and perhaps already a leading seaman, or even a petty officer; now is the time to fit him for his duties in the battle-ship of the future, to practise him in such matters as the use of machinery in connection with his duties, the exercise of guns of very heavy calibre, the working of torpedo-boats, and in fact all the more modern appliances of naval warfare, with which he may not before have been acquainted.

Since training for war service must never for a moment be relaxed, the seamen employed in mastless ships should be kept up to a state of proficiency and smartness by constant boat-work and whatever may be devised in the way of gymnastics, besides the gunnery and torpedo work and the ordinary duties of the ship; they would be also much benefited by occasionally having a few weeks' cruizing in the local sailing cruisers, if it could be conveniently arranged. Another very important item is the training in signalling duties, which should now be gradually incorporated with the other branches of a seaman's training.

The gunnery and torpedo instructions carried on in sea-going ships cannot be too carefully attended to, and no cessation in the drills should be permitted until the crew of a newly-commissioned vessel is in every way prepared to take their ship into action. Waste of ammunition in carrying out the quarterly practice is reprehensible; great care should be taken to obtain the utmost possible benefit from every round that is fired. The imperative necessity of getting a damaged gun or other weapon again into action, without delay, should

be impressed upon both Officers and men. The term "obsolete," which is so readily applied to the matériel of the Navy not immediately of the present date, has the demoralizing effect of rendering the men dissatisfied with, and callous as to the efficiency of any arms or gear that are not of the latest pattern. It should be distinctly laid down that nothing is obsolete which may be required for use in time of war, and that it is greatly to the discredit of all concerned if any part of the fighting plant, old or new, is allowed to get out of order through any shade of carelessness or neglect.

The use of masts and sails is sometimes compared with that of a gymnasium, but those who think seriously on the subject must perceive the difference, for in a gymnasium intellect is not particularly required, whereas in the smart handling of sails and spars it is indispensable, and indeed its absence may endanger all concerned. In order to make a man-of-war's man, there is no training compared with that of seamanship proper, as carried out in a masted man-of-war; it practises Officers and men in all the attributes which will be of the greatest value in time of war, viz., intelligence, smartness, fearlessness, readiness of resource, and activity, and (with the Officers) in power of command. It is invariably the case that the ablest and smartest seamen make the best and most reliable gunners; not perhaps the best gunnery instructors, for in them a quality rarely found in a good seaman is requisite, namely, the power of committing to memory long pages of drill detail, and of subordinating their own intellects to the subject-matter they have to teach.

The working of war-ships under sail is the nearest approach to what will be experienced in time of war. For instance, on board a ship in a squadron working into, or weighing from an anchorage under sail, every soul on board must be on the alert, any neglect or wrong order given may cause at least great confusion, and perhaps serious accident, and all on board feel that unless the work is properly done they will be the sufferers, probably having to anchor or to weigh anchor again, or make good some serious defect.

If it were possible to set the present types of modern fighting ships to the work they will experience in time of war, ramming the enemy, colliding, grounding, being damaged by shot and shell, their crews replacing disabled guns, hoisting boats in and out in dangerous weather, rigging jury rudders, taking disabled ships in tow under difficult circumstances, &c., we could dispense with the training afforded by masts and sails, but as this is impracticable we have no other means of training our Executive, in order to render them capable of coping with such difficulties, than that of endeavouring to make them *seamen*, and as such by battling with the elements to develop the readiness of resource and self-confidence in critical moments which is indispensable to enable them to meet the emergencies and accidents of war. Sails are not in the question, except as a means to an end, but an indispensable means, for which no other could be an effective substitute. Captain FitzGerald, in a paper on "Mastless Ships of War," read at this Institute in 1887 (see Journal, vol. xxxi, p. 121), having condemned sail drill, &c., could only suggest, in lieu,

that men "could be given so many hours a day to fiddle with the live heads of Whitehead torpedoes with the detonators in; or they could be set to work to hammer sensitive fuzes into filled shell," but of course this is not meant seriously; nevertheless, what has baffled Captain FitzGerald has baffled all others, for there is *no* substitute, and the only alternative is to allow the man-of-war seaman to become extinct. Imagine the Officer in command of a ship in war-time, who had no one on board he could depend upon to steer a course, to obtain soundings, to man a boat under difficulties, to work tow-ropes, to rig a derrick, to improvise any purchase in lieu of some damaged machinery, to secure a torpedo boom broken adrift, or even to clear a flag foul aloft on the military mast; how he would bless the so-called reformers who had abolished sailors!

3. *Squadrons of Instruction, &c.*

In time of war our fleets will be composed of all available ships, many of which will be of the latest types, powerful steamers without sail power, whose crews will consist largely of stokers and marines with a nucleus of seamen proper, and a full number of executive Officers. In fighting the guns, in repairing damage, and in doing the innumerable duties (coaling, provisioning, boat-work, &c.) upon which the fighting efficiency of the ship mostly depends, a Captain will have to rely chiefly on the ability and men-of-war's-man-like qualities of the Officers and seamen under his command, and the Navy which can display the most of these qualities will have the advantage. In times of peace the ships principally required for sea-service are those that can accommodate the largest crews, and that in a healthy manner, providing for both Officers and men sufficient employment of such a nature that the Officers have constant experience in commanding men, and in carrying out all kinds of intricate evolutions, and that the men have constant opportunities of using their intellects and learning how to carry out orders with alacrity and precision. For this purpose masted ships with good accommodation should be employed where practicable, and kept cruising as much as possible under sail.

The Mediterranean Squadron is necessarily composed of modern mastless ships (sails being of no use on that station), which would with a few additions form a powerful war fleet; and on other important foreign stations there will shortly be a fair show of modern vessels. As these increase and the older vessels are withdrawn, the necessity of providing for more training accommodation for Officers and seamen will probably be met by increasing the number of ships in the Training and Channel Squadrons. It would also be advantageous, if sailing training ships, such as the "Cruiser," now at Malta, could be attached to our squadrons on other stations as well as the Mediterranean; for instance, one might be stationed at Bermuda, and cruise in the West Indies in the winter, another at Hong Kong, cruising as far as Japan in the summer, and perhaps a third in Australia, all being employed in doing similar good service

to that performed by the "Cruiser," a vessel, for the benefit of a few weeks in which, many a midshipman has need to be thankful.

It is often asserted that the Channel Squadron should form the nucleus of our principal war fleet in home waters, and should therefore be composed of the latest types of war-vessels, which latter, it must be borne in mind, being mastless, carry very few seamen, and as powerful steamers are not suitable for long periods at sea at slow speed (in peace-time), or much use for training the seamen class even if so employed, would it not be a better policy to make the Reserve ships the nucleus of our home fleet, and to let the Channel Squadron consist—as at present—of the older ships with plenty of accommodation, and the means of keeping their large crews in healthy exercise?

Imagine the home fleet consisting of the coastguard ships, each a battle-ship of modern type, having attached to her a vessel of "Mersey" or "Melpomene" class, another of "Rattlesnake" class, and two torpedo-boats, manned when at her coast station by a reduced crew of trained seamen, marines, stokers, &c., and able at twenty-four hours' notice to complete her crew, and those of her satellites from the coastguard men of her district, and be on her way to the rendezvous at any port in the Channel. Here you would have a splendid and fully equipped fleet, manned in a most efficient manner, and ready for service; so organized that when not called out, the crews of the ships in their reduced state would be sufficient to keep everything in perfect order.

Again, imagine a Channel fleet of six or perhaps eight such ships, as "Minotaur," "Hercules," and "Triumph," intended to carry on the training of the younger Officers and seamen, principally with the view of accustoming them to a sea-life. Periodically these ships might be brought to the home ports, and turned over to modern fighting ships, each of their large crews being divided so as to man two or more of these vessels for a few weeks' cruise in the summer.

The Training Squadron is at present doing admirable work, although it can hardly accommodate a sufficiently large number of men to achieve the desired amount of training. The ships of which it is composed are the best of the older cruisers, and as they are fairly good steamers and well armed, there is no fear for their safety should a naval war be suddenly forced upon us. They are well masted enough to enable them to make a good passage under sail, and their accommodation is satisfactory, the four ships carry about 1,400 men all told, of which about half are ordinary seamen and boys under training. The work devolving on the Commander or First Lieutenants of these ships, augmented as it is by the frequent changes of Officers and men, and the constant training duties, in addition to usual routine work, is very arduous, and these Officers deserve every encouragement. The petty officers have also much more work than in most ships, owing to the youth and inexperience of those under their charge, who require continual instructive supervision. The work of the other Officers is nothing out of the common, beyond the fact of these ships having about double as much sea-work as any others.

Besides the instruction in seamanship which is in constant progress, the ships of the Training Squadron are exercised in naval tactics either under sail, or when steam is raised, under steam; the new signal books have been thoroughly studied, and it may truly be said that more signals are made in this squadron than in any other.

During the first three years in one of these ships, the "Rover," 482 ordinary seamen and 362 boys had an average of six months' training; 44 midshipmen served on board the ship, of whom 30 passed for Lieutenant in seamanship (10 obtained 1st class certificates, 12 2nd class, and 8 3rd class, two midshipmen being turned back). During this period the squadron accomplished the distance of 55,432 miles in 11,070 hours, of which 32,210 miles and 7,463 hours were under sail. Eighty ports were visited, the squadron arriving or leaving under sail alone 58 times, occasionally under difficult circumstances. As a specimen of the sailing qualities of the squadron, on one occasion the passage under sail from Teneriffe to Barbados, a distance of 2,580 miles, was made in $16\frac{1}{2}$ days, an average of 156 miles a day; on another occasion the squadron averaged under sail 200 miles a day for 9 consecutive days, completing a passage home from Bermuda in 19 days.

The cruizing of the Training Squadron in the West Indies in the winter, and in the Mediterranean, Baltic, and home waters in the summer (during which the squadron twice took part in the fleet manœuvres), was a varied experience of work, interest, and pleasure; many interesting foreign ports were visited, where the Officers had the opportunity of seeing the ships and dockyards of other navies, and were everywhere received with the utmost cordiality and good feeling; in fact, anything more instructive and generally beneficial to both Officers and men than service in the Training Squadron cannot well be imagined. There is reason to hope that the squadron may some day be increased in number, or what will be even better, that a second squadron similar to the present one may be fitted out.

4. Conclusion.

The opinions expressed in this paper as to the importance of seamanship training are thought by some people to be old-fashioned and inapplicable to the present day. That these or similar opinions were held by our forefathers there is no doubt, and it was through the strict adherence to them that former great naval commanders earned the name of being the best seamen in the world, and as such, carried all before them, making our country what it is now. Are we to lightly barter away the heirloom of their prestige? Is there any reason why England should not still boast of at least giving her naval Officers the opportunity of being the most experienced seamen in the world? If to be experienced seamen is out of date, we may find to our cost that winning a naval action is also a thing of the past.

It is believed to be a fact that none of the principal ocean steamship companies will admit an Officer into their employ, unless he has

served an apprenticeship of four years in square-rigged sailing ships, and some companies go even further, and will only take an Officer who has commanded a sailing vessel. What the shipowners find is that a youngster apprenticed in a steamship learns how to clean bright work, but practically little else.

The reasons for the unpopularity of seamanship proper are not far to seek: in the case of some Officers—we hope but few—the real fact is that they do not like work, and in masted ships on long cruizes they are not so comfortable as in mastless ships constantly at anchor or alongside the dockyard wall. The voices of these gentlemen are frequently heard in the Service papers, deluding the public into the belief that theirs is the advanced view of naval matters. Another class of objectors to seamanship training is found in certain Officers of the scientific branches, who devote themselves so entirely to their own particular work (often to the great benefit of the Service), that they lose sight of, or even ignore the necessity of employing means for the purpose of training which are foreign to their sympathies, forgetting that hitherto we have only employed Officers and men who have been brought up as seamen, and that we have no experience of what is to be expected if their training as such, ceases. It is notorious that no other means of training is suggested by these Officers beyond a vague assertion that the personnel ought to be trained in the vessels which they will have to fight, which apparently implies maintaining our Fleet on a war footing. Again, a third class of opposers to seamanship training is composed of those who, on political grounds, would insist on the pushing forward of modern ships, and—disregarding training—are satisfied with the personnel so long as it is numerically sufficient, feeling (and perhaps with reason) that while the older ships are employed, and men-of-war's men are trained as sailors, there will be so much less money to be spent on the newer vessels of the war fleet. This party includes in its numbers some of those Officers who have completed their term of service, or who, for other reasons, have no further prospect of commanding our ships or fleets, they therefore are apt to drop out of their reckoning the importance to a Captain of having with him experienced Officers and seamen on whom to rely in time of war. The cause of objection of this class deserves attention, its remedy, however, is not found in sacrificing one great object to attain another, but rather in so providing for the wants of the Navy that neither the personnel nor the matériel should suffer; and by a judicious organization the war fleet be periodically mobilized, while the time during which it is not mobilized should be passed by at least the younger Officers and seamen in healthy and beneficial employment at sea.

There is undoubtedly in nearly all experienced naval Officers a latent, if not an active opinion, that seamanship in the sense suggested in this paper is still necessary, latent and unexpressed by some because they are fearful of being classed as out of date; but is the withholding of such opinions beneficial to our Service? It is to be hoped that those who honour this paper by joining in the discussion will throw off all reserve; and if some speakers do not possess even a

latent regard for seamanship, they will not express their objections in vague terms, but will suggest some definite alternative either for the training of the Executive or for its reorganization.

Lieutenant HENRY CHAMBERLAIN, R.N.: Mr. Chairman and gentlemen, the subject of naval education appears to me to be essentially one in which Officers below the age of fifty certainly should mainly interest themselves, because if they now are in active service as Captains or Commanders, in a very few years' time the fleets officered by young officers will be entrusted to their care, and if those Officers are not sufficiently trained, they (the Admirals) will suffer probably like Admiral Byng suffered in the last century, and on their shoulders will fall the terrible weight of inefficiency which is not due to them, but to the fact that the subject of naval education is looked upon at present as of secondary importance. It is really of primary importance. We have at last discovered that we have not enough ships, and are going to build seventy more, but we have not got sufficient officers to begin with. Supposing, however, for the sake of argument, that we had them, let us look at the suggestions that are brought forward in this paper. The first thing which strikes one is that we had better get our definitions. What do we mean by "seamanship"? We talk of "sailors," seamanship, and "seamen." One man means one thing and another man another thing. In my private opinion "sailors" are essentially men who have passed away. There are no "sailors" in the strict sense of the term, any more on the active list, or hardly any. Without disrespect, if I may say so, there are hardly any "sailors" of the olden days left; but I should be extremely sorry to say that there are not very good "seamen." They are very distinct people from "sailors:" as distinct as chalk from cheese. "Sailors" no longer exist, but *seamen* may exist to the end of days. As long as the sea exists, so long *seamen* will exist. There will be always machines to put on the sea, which you call "ships," which people will be able to manage in all winds and weather; to run them into one another if they are enemies, and to keep clear of each other if they are friends. These men are *seamen*. We are rather apt to be down on our luck on this question, and to think that *seamen* are passing away. They have not, and they need never pass away. The young men of the present day have as good intelligence as their fathers, or even their grandfathers, and you have as good material now as ever you had before in the Service. That is a statement made by Admiral Sir Geoffrey Hornby, who, I suppose, is one of the best Officers in the whole Navy, and he says, "You have as good material now as ever you had;" but he adds as a rider to his statement, "You have splendid material, and you make absolutely no use of it." You have intelligent young men, you admit them at fourteen, but you do not train them. Talking about this question of training, it is a very good plan to begin at the beginning. Captain Noel, of course, is dealing with a very large subject, but I wish to ask this question—Had we not better begin at the beginning, and train our young Officers from the day of their entry? Scarcely a single reference has been made to the inefficiency of the present system of training, and the possible efficiency of a modified system. As a matter of fact, it is impossible to attain the objects laid down in this paper unless you make a *radical change* in the whole system of training, beginning at the age of fourteen. Captain Noel says, "The three years of a midshipman's service before passing for Lieutenant should be more devoted to learning his duty as an Officer than to anything else." Quite so. Everybody rightly said "Hear, hear" to that statement, but how are we to do it? I know an Officer, present in this room, who has a son in the Royal Navy. The boy is on the East Coast of Africa, where all day long he is away picking up valuable experience in open boats, employed possibly against slave dhows. With ten or twelve men, you come suddenly on a slave dhow, and on such an occasion the intelligence, the pluck, the decision, the forethought, everything which makes a young seaman, would have to be brought into play at a moment's notice. What is happening to that boy? Every week that passes over his head is so much time *lost*. Why? Because, under the present system, he is not under a Naval Instructor but is away in a boat. The actual fact of the matter is that these midshipmen on the

East Coast of Africa are going to be recalled and put into these large ships. They are going to be removed from the sphere of experience to be put into the sphere of theory, because if they are not taken away they may only obtain third classes at Greenwich, and your best Officers will be delayed in promotion, while your least good Officers will be promoted rapidly. Now the father of this young boy is an extremely able Officer, who belongs to the old school, but he also has gone with the times, so he is saying this: "I know that from a seaman's point of view it is bad that my boy should leave his present ship, but I know from the man of the world's point of view it is a good thing that he should leave that ship. Which am I to do, to ruin his career, or to make him '*no sailor?*'" Which would you do? Which would any father in the room do? He would chuck the seamanship overboard, because he does not want to ruin the boy's career—and there is the evil of the whole system. You have a system at present which works extremely badly, and which every year works a little worse, which not only is condemned by outsiders, who see the most of the game, but is also condemned by the intelligent Sub-Lieutenants themselves. I have spoken to them, and said, "Putting all prejudice on one side—for we are all old Navy and are all new Navy—what do you think you know about seamanship? What have you had the opportunity of learning?" This man whom I was speaking to, a very intelligent "Sub," said, "To tell you the honest truth, I do not know much, and for a very good reason, that I have never been taught." But whose fault is that? It is the fault of the system. If he is taught it (*i.e.*, seamanship) his career is jammed, because he gets a third class at Greenwich, and if he is not taught it, he is perhaps put, at the age of twenty-one, on board a ship, an ironclad, which has cost half a million, without having had *any* experience. In the old days, in the days of our gallant Chairman, a lad at the age of seventeen knew more seamanship than our Lieutenants of four years' standing. I say with all confidence that that is a great scandal, and we must alter our system. You referred, Sir, to a damaged gun, and you said that now-a-days a seaman could not replace a damaged gun. I think it is only fair to the seaman of to-day to say this: if Lord Dundonald was sitting there he could replace his gun, because two fellows could lift it, and even forty years ago the guns were mere toys compared to what they are now. If a gun gets damaged now, the best seaman in the world cannot lift it with the appliances on board ship, not the very heavy guns, therefore how could they be removed and replaced? What purchase could you get to lift your very heavy guns on board any ships? Even if you had masts you could not trust to masts. It is not a question of seamanship, therefore, but question of dead weight and "purchase." The size and power of the man has remained the same, but the weight of the gun has increased in an alarming proportion, so that I do not think it is fair to the seamen of the present day to say that they could not replace their guns. The lecturer refers to seamanship in this way: "Imagine an Officer in command of a ship in war-time who had no one on board he could depend upon to steer a course"—a "course" is steered by compass; and masts, yards, and sails are perfectly unnecessary in order to impart such knowledge to our men—"to obtain soundings"—this is done by using a lead-line, and no masts are required in order to instruct a man in the art of taking soundings—"to man a boat under difficulties"—no masts required in order to do this—"to work tow ropes"—you can tow a derelict without masts—"to rig a derrick"—a derrick requires no masts beyond one, which would take the topping-lift; I believe I am right there—"to improvise any purchase in lieu of some damaged machinery"—purchase can be improvised without absolute masts; purchases are made with ropes and blocks; if you will go to Woolwich you will see some marvellous purchases for lifting these 63-ton guns—"to secure a torpedo boom broken adrift"—that requires no mast, or certainly not more than one military mast—"or even to clear a flag foul aloft on the military mast"—well, that requires a man, as we all agree, who has had training, and for that you require more gymnastics. As regards training squadrons, the training squadron is an absolute necessity for maintaining our supremacy at sea as a fighting Power, not on account of the sails, but on account of the scientific intelligence, the originating power, the general activity and bodily health acquired by trained men. I think that these training squadrons are most useful for that. I hope that they will continue so.

Admiral Sir GEORGE WILLES, K.C.B.: Last year I met Captain Shaw, of the Fire Brigade, when he informed me that he had ceased to take men-of-war's men into his Fire Brigade, because they had lost their character of agility. That being the case, you may imagine with what pleasure I have heard Captain Noel's address. I agree with him in nearly every point. The Training Squadron has been of immense utility; the First Naval Lord deserves great credit for having had the moral courage to re-establish it. There is no doubt a large number of my brother Officers (I say it with regret) who ridicule the idea of a ship with masts, and spars, and sails, under any circumstances, but I maintain they are wrong, and if we want to keep up the character of the British sailor we must retain masts, and spars, and sails, but for training only. Of course, with an increased Navy, instead of four ships there must be at least six, but that is a detail. Captain Noel has carried us up to the point of the men quitting the Training Squadron; I rather regret that he has not gone further, because there is no manner of doubt that any great measure of success in our battles of the future will be due to the most skilled gunners. I have had the opportunity of watching what has been going on in the training of our men, and I really think it is most faulty. When the "Excellent" system was first established we had not a standing Navy, and it was arranged that a sufficient number of men should be trained, so as to get a captain for every gun, and enough men to work the magazines; but in 1852 we established a standing Navy, when we ought to have amended the whole system. Many of you would hardly believe it possible, but our men are still divided into sheep and goats, and any young man who has been a bit of a scamp, and some of us, I have no doubt, have been scamps in our time, is sent to sea before he has become a skilled gunner. What is the consequence? The number of young men whom I had to get discharged from the Navy during my period of service at Portsmouth really pained me, and chiefly for breaking leave. Whereas these young men, these scamps, would be just the men we should be glad to have in battle. They are trained at great expense and then discharged; whereas, if the sheep and the goats were all mixed together, the latter would forget all their troubles, and most likely turn over a new leaf. Many of them would marry and settle down. There is another point Captain Noel has omitted, another very important question—*stokers*. Nothing can be worse than the training of our stokers. I was not out with the ships last year, but I read in the newspapers, and I read that most valuable report of my three brother Officers, which stated that there was a great want of trained stokers in the Navy. Now you cannot train a stoker under two or three years, and you cannot train them without driving your ships at full speed. I do think it is necessary that we should follow—I am not too proud to follow—the Italian Navy, and adopt their plan, and keep one or two ships constantly running out to Malta and Gibraltar at full speed. What is the use of talking about a ship being able to steam 18 knots, when you have not got the stokers to drive her at that speed? It is absurd. With regard to the Officers, I would make one suggestion: there is no doubt that the young Officers of the present day are a splendid set of young men; but I think they want a little more, I might say a good deal more, sea-training. I have always thought that when they quit the "Britannia" the naval instructors might be left behind, and that for the three or four years they are away the boys might learn seamanship; going away in their boats teaches them something better than working in the fore cabin. But it is said, "Oh, but if you interrupt their studies they will not get five first classes. Really, I do not much care about it; I am thinking of the Navy of the future; I want to have fighting men and fighting Officers, and that cannot be learned by studying π .¹ A gallant friend of mine, who, I am sorry to see, has left the room, and therefore perhaps I ought not to quote him, said, very truly, many years ago when he was pressed, that the success of an encounter depends a good deal more on

¹ It is, of course, necessary to have a proportion of Officers with high scientific attainments. After the examination for the rank of Lieutenant (which should not occupy more than a few months), young Officers who have a talent for mathematics should be allowed to study at Greenwich. A great deal of time is now wasted in cramming those to whom it is distasteful.

the stomach of the Captain than on anything else, and he never said a truer word. Well, but stomach can only be acquired by experience; it is impossible without sea training. You would scarcely believe it possible, after what our gallant lecturer has said, that a Commander was lately appointed to command a ship who had not been to sea for ten years. Well, no insurance office would insure a merchant ship under such circumstances. Gentlemen, I won't detain you longer. Unfortunate circumstances have prevented me from attending any public meeting during the last five or six months, but I should like to express my grateful thanks to those gallant brother Officers of mine who have agitated and brought about such a grand increase of the Navy. I am sure you will all join with me in expressing our thanks to them. There is no doubt of this, that without a powerful Navy England will be lost. There must not be a question of an enemy landing on our shores: they must not be allowed to land! I see a gallant General here, who will forgive me for saying that if the enemy does land, *corps d'armées* will be of no use; it must be a question of the command of the Channel.

Captain The Right Honourable Lord CHARLES BERESFORD, C.B., M.P.: I think the thanks of the whole Service ought to be given to Captain Noel for this paper. It is impossible to conceive anything of greater importance than the training of Officers and men for the sea. Captain Noel, I think, has been a little hard on some few of us who have opposed as hard as ever we could having masts, yards, and sails in battle-ships; but I think he has misunderstood our reasons for that opposition, and I will endeavour to explain what our reasons are. We hold that we have a Fleet insufficient for our wants, and therefore every ship we have, of every sort and class, ought to be a fighting ship—in other words, it ought to be ready at a moment's notice for active service. We hold that if you put masts and yards into a battle-ship proper, you may put her in a position (by having these masts and yards when suddenly called into action) of losing the action because she has got them, from the mere fact that in these days of accuracy of artillery it might be possible to knock those masts and yards over and foul the screw. On the other hand, I hold as strongly as Captain Noel, and I heartily agree with him, that the first necessities in your ships are seamen, that is to say, men of actual experience at sea, and a man cannot be an efficient Officer or a proper man to man our ships unless he has actual experience, and experience of a very extended character, at sea. I cannot speak about myself at this moment, but I feel very often in the House of Commons (as I sometimes endeavour to utter thoughts through my mouth that I believe are the thoughts of my brother Officers) that it is impossible for me to do so, as I have not been at sea for the last six or seven years; and many Sub-Lieutenants in the Service would give me two stone and a beating with torpedo-boats, as their practice is superior to mine. I entirely agree with Captain Noel as to the necessity of actual experience at sea. I do not wish to criticize him severely, but I do not think he has explained what we ought to do. My own opinion is this, that taking the home fleet, the home fleet ought to be sent to sea working in all sorts of weathers, three or four months in the year actually at sea. I would use the "Admiral" class as the Channel Fleet, but I would take some of their coal out and put a 5-inch steel belt on them to keep out high explosives, and so make them good fighting ships, for at present with their light ends, which can be so easily pierced, they are liable to go over. Then I would have not a half-and-half machine, like the "Minotaur," where men are doing more or less useless work, in my opinion, but have a regular training squadron in the Channel, besides a regular training squadron to go round the world, as it is doing now. I would have two training squadrons, and besides that I would have a cruiser in every station that England possesses. There is a practical way of doing it, but I do not think you get what you want if you mix up the two things. You must begin by sending your men into the cruiser ships and teaching them what is essential in order to obtain readiness of action and resources, without which no seaman is worth a snap of the fingers. The essential thing, as the gallant Admiral has pointed out, is practice with artillery, that one shot may win an action. You must teach your men to be as capable of pitching a shot in the proper place as it is possible to do. I entirely sympathize with the gallant Admiral. For years he has been trying to get a regular sea-going gunnery school, but besides that we must teach our men to be seamen. There is another ques-

tion about teaching the executive branch more about the use of machinery. In the old days, even in my time, I know perfectly well that your executive could tell your artificers how to repair a foretopsail yard if it was sprung. It is just the same now; your executive ought to be able to say to the Chief Engineer, "Do so and so." It is the Chief Engineer's work, but he must be under the executive, or else you will never win your action. Whether you are right or wrong, the executive should say, "I want that shaft repaired that way." The Captain of the ship and the executive Officer, in my own humble opinion, should know every bit as much about the ship as he did in the old sailing days, and say how a thing is to be done, no matter who is the expert to do it. The lecturer also spoke about the question of signalling. In my opinion it is a most important question to teach Officers and men far more of signalling than they know at present. At a particular moment in an action a clever Admiral may see something that would let him win the action. What does he want to do? He wants to get that something out of his head into his Captain's, but under your present system he cannot do it. I know the Admiralty have tried to improve it, but signalling is bad all over the world. Our present system of signalling not only in itself is bad, but the men that we employ are not sufficient. We must also remember that a whole fleet may be disorganized in a moment because your signalling staff has been destroyed. It therefore seems to me that the question of signalling should be largely added to the education of Officers and men of the Fleet. With regard to trained stokers, the stokers are the men who really win your action. We may say what we like of the man in the engine-room, but that man has to be a great deal more plucky than any of us: he never knows when a torpedo is coming towards the ship; he has to run the ship, and he does not know where he may be the next moment. That man has got to work at those fires in a very hot place, but unless he goes on working, the Captain cannot put the ship in position to enable him to win his action. Therefore I think the training of your stokers and engineer Officers ought to be entirely remodelled and reorganized. We have at present an entirely haphazard system, which would be very detrimental to us if we went to war. I also entirely agree with what the Admiral said as to the question of scamps. I was rather a scamp myself, I am afraid; but depend upon it a great number of men of this kind, as the Admiral has explained, who have been sent out of the Service are the very men you want to fight. Why the Admiralty want to get rid of these men for some offence against discipline I really do not know. Some people are always cantankerous. As a rule, the best boy in the school is the biggest "pickle" he has the pluck to get into, and the scamps are very often the best men you have got. They are altogether different from the scoundrel and the blackguard. A scamp is a good chap, always was, always ready for a fight. But many of these men are debarred by some absurd organization that they did not know of, they are debarred from becoming seamen-gunners. In my opinion your Gunnery Establishment is too exclusive: you should train all the seamen and all the Officers, as far as you can, to gunnery. It is not that we do not want experts in the Gunnery Department, but the Officers and men should have the advantage of becoming gunners, in my humble opinion. I also agree with what the Admiral said about the younger Officers of the day. I believe we never had a personnel better than we have now, both of Officers and men, and I am not going to make myself out an old man, I hope. But as to the younger men in the Service, I think the whole of their wish is that they should be taught in peace what they would have to do in time of war. We must make our men and Officers able to do by ordinary experience what they would have to do in time of war. I think their mind is at one on these questions which I have so often endeavoured to bring before the public; and on which I think my brother Officers agree with me—if I did not think they would agree with me I would not say it—but we want organization. Our want of forethought in many questions connected with the Fleet is perfectly extraordinary, and I do believe, though perhaps some of my seniors won't agree with me, that you will not get that altered until you alter the present system of the Board of Admiralty, so that there shall be a responsible head for each detail, which you can hang up when anything goes wrong. If anything goes wrong at present, all they say is "Oh, it is the Board of Admiralty." I do think, in conclusion, that Captain Noel deserves the thanks of the Service for what he has brought forward, and I

hope sincerely that some definite scheme, if not on the lines I have proposed to this meeting, but something on that class of line, of teaching your men to be seamen first, and to spend some money on these cruizing ships, will be carried out. Even if they are sailing ships I do not care, but I think you should teach your men to be seamen first, and then draft them into the great battle-ships and cruisers and torpedo-boats afterwards. I think that would be the best way of meeting the question, which to my mind is second to none in importance, as if we are to exist as a nation we must keep the command of the sea, even though our Fleet should have to be double what it is at present.

Lieutenant MURRAY AYNESLEY, R.N.: As a young Lieutenant in the Service, I propose, with your permission, to say a few words. Captain Noel has given a very good *r  sum  * of the ideal of a naval Officer, but I agree that the use of masts and yards, his ideal, is unattainable. No doubt there has been a strong feeling lately among the younger branches of the Service against masts and yards, for where the guns and yards have appeared together the guns have always had to give way. The ship has to be made a perfect fighting machine, and it is no good putting up royal yards to play about, and all that sort of thing, if the guns are to be neglected. The ship must be made a fighting ship, and the yards and masts only used as an auxiliary for that purpose. Until that is thoroughly realized, the best thing will be to have the sails screwed on to the yards, so that no one but a blacksmith could play with them. At the present moment the men who ought to be learning how to fire a gun and use a rifle are playing about on the royal yards. As regards the Officers, the present system of training, I think, is very wrong in many ways. Lieut. Chamberlain's young man, I think, has mostly his Captains to blame: I do not think it is possible that a midshipman four years at sea should not learn anything of his profession. I think the cadets from the "Britannia" ought to go in a sea-going training ship for six months; the ship to be of the size of our smaller gunboats, and to be worked entirely by the cadets. This scheme was tried on a larger scale some years since, but the large scale made it a failure. The cadet should be a short time in a large-masted ship, and then for three years in a corvette on a foreign station. After that time his service should be completed in a mastless ironclad. The present examination in seamanship I can only characterize as a farce; you can toss up "Heads I win, tails you lose." If I get one Captain he will give me a first; if I get another Captain he will pluck me. For this a pass examination in seamanship should be substituted. Then on returning to England a Sub-Lieutenant should pass a pass examination without a preparatory course in navigation alone. They should then go through the gunnery, torpedo, and pilotage courses as at present, and then, optionally, a course at Greenwich. The present mathematical course is simply an attempt to put all the round men into square holes. Certain men never will learn mathematics, and you waste a great deal of a young Officer's time by sending him there. I have known one or two Officers who have come away from there, and the only time they wanted to use their mathematics was to find how much flannel was wanted to line a gun cover, and then they had to send out to some one to get him to do it for them. The extra course at Greenwich should last about three months, and the examination should be about the present Beaufort standard. It would be only the really first class men, and of course they would get a certain amount of kudos. Their promotion from Sub-Lieutenant to Lieutenant for examination is, I think, not at all right. You just miss a first class and get a second class instead: that means eighteen months time, which is hardly fair. As regards specialists there, I think there is room for many modifications. You do not want every Gunnery Lieutenant to be up to x and y : what you want him to be able to do is to teach the men under him the use of their weapons. If an Officer wishes to go in for a higher course of mathematics he ought to have further time. At present the course stops short just as you are beginning to learn. The first class people should have a whole year instead of nine months, and then go to Portsmouth. Sir George Willee spoke about the education of seamen gunners, and about men not being allowed to go in for gunnery owing to previous misconduct. I think that is very wrong indeed. There were in my last ship in the Channel Squadron two or three men who were really a credit to the Service in every way, and those men were not allowed to go in for seamen gunners simply because in their young days they

had fair characters awarded them. As regards the training of stokers the difficulty is to get men of sufficiently good physique; the second class stoker on entry is not as good in that respect as he should be. The midshipman's education at sea I think ought to be in the hands of the Lieutenant and not of the Naval Instructor: I think he would give better all-round instruction. Of course in a sea-going ship there is no doubt the working of the ship ought to be the principal point, and all instruction should be subordinated to that. Signalmen I do not think you can possibly train beyond a certain extent. A signalman is born, not made—you can vastly improve them, but not make them. With regard to the results of the training squadron service I must say, from the men I have seen coming out of it, they have not been so good as I could have wished. The cause is that they are too near home, and the cruises are not long enough. The men deteriorate in physique, they are really overworked for young men between eighteen and twenty-one. They also deteriorate in discipline. Too many young men are shipped together without a sufficient leaven of older hands, and the continual return to home ports may also be looked upon as a cause of this. When they come away they do not know very much about their useful drills, they affect to despise the humble seaman gunner, pretending that they are sailors.

Lieutenant LOWRY: Having carefully gone through the quarter bills of the ships in which I have served as First and Gunnery Lieutenant during the last seven and a half years, and taking gunnery instructors, torpedo instructors, captains of guns, and leading torpedo men, as specimens of highly-trained men in both branches, gunnery and torpedo, I find the following results: twenty-six were thoroughly efficient in their fighting and instruction duties, and had received a thorough seaman's training in masted ships. One had served in mastless ships only, and luckily was equally efficient. Three captains of guns were poor seamen, and had very little really seaman's training in sailing ships, but they were good shots and were retained as captains of the guns for that reason. They had the natural gift of being able to lay a gun. There was one torpedo instructor, and three leading torpedo men, good, theoretical men, but who lost their heads and were nearly useless in getting work done when in charge of a party of men. They had served almost entirely in mastless ships, and had been quickly rated on account of their readiness and quickness as instructors, and instructors only. Several of the best practical acting seamen gunners, and one who was acting captain of a gun for a considerable time, were refused at the gunnery ship on account of past conduct, or, in the case of the captain of a gun, because he could not write a good hand, though he was an uncommonly good captain of a gun. Probably the work to be done when a ship is aground is similar in some degree to much that will fall to our lot in a naval war, and tests what men are made of. During the week of varied and incessant work in H.M.S. "Sultan" when on shore, whether it was in rigging purchases, dismantling and transporting guns, getting sails over to stop the leaks, or placing and rigging a steam pump, the men who came to the front and did their work thoroughly well were the men who were active, well trained seamen aloft. It was not always the best seaman gunner, torpedo man, or marine artillery man who showed most readiness of resource. Wholly agreeing, as I do, with Captain Noel in his main contention that men should be thoroughly well trained in masted ships at sea first, there are some minor points in which I differ with him. He says, "It is certainly necessary that a few select Lieutenants, who show great aptitude for scientific pursuits, should have every opportunity and encouragement in becoming experts in their special lines," and I gather from the paragraph that, barring them, he proposes to do away with the gunnery, torpedo, and surveying lines. If so, the Drill Book and fighting instructions of the Services will be largely in the hands of Officers with small experience at sea, the very result that the whole paper so much deprecates. Each branch of the work will, I believe, be infinitely better done by those who make a special study of it than by an Officer who may be watchkeeping in a troopship, Gunnery Lieutenant of an ironclad, in a surveying schooner, or in charge of Whitehead torpedoes alternately. Few men can give the necessary time to keep up thoroughly the knowledge of all the minor details of each branch. We must remember, and no doubt we always do, that the Service is far more complicated now than it ever was before: there is far more to learn, and I do not think, with all due respect to Lord

Charles Beresford, that the ordinary executive Officer in a ship can make himself thoroughly master of every detail in the non-executive branches. I think he will do his work best by knowing sufficiently about steam to see that the Chief Engineer does his duty, and then let him alone to do it. The result of having the Channel Fleet composed of masted and so less efficient ironclads is that in every "war-scare" of recent years these ships would have had to bear the first onset had war broken out. Notably this was the case in February, 1888, when the Channel Fleet of five of our most ancient ironclads were hurried from Corsica to Genoa and Spezia, and if certain things had happened which people talked about, they might have had to meet, burdened as they were with masts and sails, the French Toulon Fleet.

Admiral WILLIS: Throw them overboard.

Lieutenant LOWRY: But that cannot be done till war is declared, and it was not done till it might have been too late. The order was given to steam at full speed from Corsica, and during that time war might have been declared, and our masts and sails would not have been overboard; moreover, we should then have to extemporise a very large number of fittings, such as iron-top screens, to make these ships efficient. In conclusion, I would strongly urge that we make our Officers and men thorough sailors first, and then put them *all* through their course of gunnery and torpedo, selecting the best for seamen gunners, not only for instructors but for captains of guns, and for the more important numbers at the gun. We should have at least for heavy guns two men at each gun, who are thoroughly capable of making a good shot, and not only the captain of the gun. I must differ with a previous speaker about the results of the training squadron. I happened to be in a Channel Fleet ship, where we had a large number not only of young seamen but of petty officers, and these men, who had been brought up in the stirring work of a training squadron, were more efficient than the men they replaced who had been brought up in Channel Squadron ships, they rapidly picked up their gunnery and torpedo work. Let the sailing be done in largely increased training squadrons, and let our Channel and Foreign Fleets be thoroughly serviceable fighting ships. On the outbreak of war it might be necessary, and most naval Officers think it would be necessary, if we have an opportunity at any rate of making a dash at the enemy's fleet wherever they were, whether ready or not, at sea or in harbour; and we might then be able to strike a deadly blow at their power, which no amount of training in the personnel and no perfection of material afterwards, would enable us to effect as efficiently later on in the war. I am sure it would be the wish of every naval Officer, young or old, past or present, and whether serving in old or new type of ship, that he might be in it on that occasion.

Captain CHARLES JOHNSTONE: So much of the ground taken up by our lecturer has been gone over already, that it is rather difficult to strike out in a new line. I should first like to speak on the question of masted ships and the Channel Squadron. I cannot help thinking there is rather a mistaken idea in the Service with regard to the advocated use of masts and sails. I think the two things should be kept entirely apart, viz., masts and sails in the Training Squadron, and masts and sails in the Channel Squadron, that is to say, in ironclads. I think everybody will agree that masts and sails in the Channel Squadron are useless, and I believe everybody on board those ships feels that they are not there for use; they look upon them as only a way of making so much work. Sail is made but steam is not stopped; the engines are kept going at the same time, and everybody feels that the sails are a mere farce, they have merely been set to give the people some exercise, and nobody bothers his head about trimming them, because they are not really being used; to brace the yards up might interfere with the routine, and therefore it is not done as it would make no difference to the ship. You set all sails in the "Minotaur," but it does not make any difference one way or the other. I think all this gives a mistaken idea, and I must say I wholly condemn the masts and sails in the Channel Squadron. Not long ago the Admiral in command requested that the studding sails should be removed from ironclads. Studding sails no doubt are useless in an ironclad; the masts and sails are equally useless, and if one thing is removed why not the other? If the masts and sails are kept there for the purpose of gymnastics, or to teach men the use of the sails, why not retain the studding sails as well as the sheet; but I must say I condemn them altogether. In the Training Squadron it is another

thing. We are accustomed to rely upon our sails; we make our passages under sail, and work our ships in and out of harbour; we work our ships sometimes in and out of harbour in circumstances which would have been considered worthy of notice even in the days of sailing ships. Our ships are long, undermasted, and, I won't say unhandy, but certainly slow in their movements, and it requires just as much judgment to handle those ships as it ever did in the days of sailing ships. That being the case, I think the exercise in the Training Squadron under sail is perfectly efficient. I know some distinguished Officers, and I might mention Sir Thomas Symonds, who are entirely against having sailing ships only as training ships, they consider that all ships ought to have steam power, therefore much cannot be said against our Training Squadron on account of its having steam power, but the sails at present are perfectly efficient. If those who object to masts and sails would consider that it is not the same thing having them in a training squadron or the Channel Squadron, it may perhaps clear up the difficulty. There is only one thing in Captain Noel's paper with which I disagree, and that is when he says that the present system of training young Officers is satisfactory. It is so, he says, if they are kept up to work at sea; but that is just what you cannot do; when you have a midshipman in the fore cabin at school he cannot be attending to any other work. A boat midshipman is a boat midshipman by name, but he cannot take the interest in his boat that midshipmen formerly did. Formerly a midshipman was always away in his boat; he was interested in his boat; he was there to see his boat hoisted up, and to see that all was right about her. Now it is quite the contrary: a midshipman does not care whether the boat is clean or dirty, he takes no particular interest in her. I think it is very objectionable, because it kills the first buddings of zeal in the young Officer. On the other hand, a higher standard of education, that is to say, of theoretical education and book-learning, is necessary; a higher standard is now necessary than there was formerly. We cannot go back to the old-fashioned way, where the youngsters in the Service were required to learn the three "R's," and nothing else; we must have a higher system, and to do that we ought to clear the school work away entirely. The youngster should have got through all pure school work, that is to say, pure mathematics and all those things; and he should have got a thorough grounding in that before he goes to sea, and when he goes to sea he should devote himself solely to professional subjects, that is to say, he should then begin the application of the things he had learnt before to his profession as a seaman, that is to say, the trigonometry and the different mathematics he had learnt before should be applied to work out navigation and other problems of that nature. If that were the case we may at once do away with the naval instruction. We have plenty of Lieutenants in the Service who are quite capable of instructing young Officers. It is an entirely different thing to what it was formerly, when Lieutenants, as a rule, were uneducated, and certainly it was difficult to find an Officer who had a knowledge of mathematics. We have plenty of Lieutenants thoroughly well educated, and perfectly capable of taking charge of midshipmen, in fact, I may say much more capable of taking the charge and instruction of midshipmen than average naval instructors. One speaker mentioned that the Lieutenant would also take charge of the other instruction of midshipmen. That I quite agree in; it would be an excellent plan; but there is another important advantage, which is, that in the great outcry against civilians on board ships you would remove the civilians and increase the number of Lieutenants; you would have an additional Lieutenant in the ship; he would be there for the instruction of the midshipmen. You would have an additional fighting Officer, so that you would have positively an additional Lieutenant in the Service without any additional expense. That is a matter very well worth attention. To do that we must enter the midshipmen rather later. There are objections to that; I know that many object very strongly to that, but I hope the objections will be overcome. We know that distinguished Officers have entered the Service late; we know Lord Dundonald entered late, and therefore I think we must not say a youngster cannot learn his work if he enters later; besides, it is to be remembered there are Officers at the present time in the Service who entered at a later age. A distinguished Officer entered at the age of fifteen; the average age is now fourteen. I think there were some Officers who entered at fifteen and a half, and some of those

Officers hold now distinguished positions in the Service. I think that is well worth consideration, especially when we think that we should sweep away the whole of the regular school instructors, and should have the midshipman absolutely free to do his duty without any interference on the part of education. One more point, with regard to masted ships. I think every sea Officer will agree that the only thing to make seamen is to keep the ships at sea. What we want is, that we should be at sea; we ought to spend our time at sea, and ought not to be wasting time in harbour, which is the rule of the Service now rather than the exception. The expense of keeping ships at sea under steam would always militate against that; there would always be an objection because of expense. If a large number of training ships, fully masted, were steam ships as well, you could keep them at sea under sail without expense, and that is a very great argument indeed. I do not think anything could be said too strongly in favour of keeping our ships more at sea than they are at the present time.

Captain LONG, R.N.: After the very eloquent speeches we have heard, I will not detain you one moment, but I should like to tender our thanks to Captain Noel for bringing this subject before us again so ably. There are one or two points on which I should like to remark. I cordially agree with all the speakers who have put before you that the first essential is that our Officers and men should be seamen, that is to say, that they should have their sea legs, and be just as much at home at sea as on shore, and they certainly never will be unless they are kept at sea a great deal more than they are at present. There was a curious instance the other day: a ship went round from Pembroke to Plymouth, and everybody was sea-sick, I believe, from top to bottom, senior Officer to junior stoker. An instance of the same kind occurred to me when I was in command of the "Agamemnon," when we were going down Channel against a strong breeze, the stokers were all so sick that they could not stoke. It therefore seems that if you exercise one-half of the Service without exercising the other half there will be difficulty. There is another point I wish to bring before you. It seems to me a mistake that we allow our young seamen in many cases to be detained in harbour ships. I happen to know several cases where young seamen under twenty-three years of age have been kept three years in a ship like the "Nankin." It has been reported on by the Officers, and everybody deplored it; but surely a system under which such things can occur must be very faulty. It is because we have not enough ships and a large enough training squadron; we ought to have two or three such squadrons, and to make it an essential point to keep our Officers and men at sea. Captain Noel speaks of the manoeuvring ships under sail as the nearest approach to what will occur in action. Now I cannot agree to that, because in my career, and specially when I served under my friend, the gallant Admiral, Sir George Wiles, I had the pleasure of seeing a good deal of boat tactics under sail and steam, and the part of my experience which I think most valuable from the point of view of carrying a ship into action was that part in which we were doing naval tactics under steam, more especially at high speed.

Captain NOEL: May I ask if that gives education to anybody besides the Officers actually carrying on the ship? When I say "taking a ship into action," I refer to the whole crew.

Captain LONG: Quite so. I was going to say, the manoeuvring of a ship could only exercise the man who is doing it, but if the crew and Officers are at their quarters, and are pointing every gun as they would be in action, I think they all gain a great deal of experience which can only be gained in that way. I think we do not do nearly enough of that. It has been advocated by many Officers; I could mention Captain King with regard to torpedoes, and I think most of us who have to do with torpedo-boats find we gain a great deal of experience from having a number of vessels moving about; it was a point we had not previous experience of, because the slow boats that we exercised with whenever possible in the Navy do not give you that experience that you have when you are going 18 knots. There is one point worth considering in that matter, that the experience a man gets in a sailing ship is such a totally different thing from what he gets when steaming at full speed in a modern steamer. The only experience that is valuable is what you are going to have in action; it is no good having other experience; you must

actually point your gun when the ship is going at a high rate of speed, and your stokers are strained to the utmost. I would remark also there is nothing said about training the seamen as stokers, but something of that kind has been advocated. I think the man who is in the stokehold wants as much training as the man on the topsail yard. I would also urge the great importance of tactics. Admiral Baird spoke very strongly last year on the importance of studying tactics. I am afraid it is still the case that we have no regular course of instruction in what might be called strategy and tactics; as part of our curriculum I am afraid it is still wanting.

Admiral P. H. COLOMB: I should like to add something to the last remark of Captain Long. The Government have made some advance towards teaching strategy and tactics at Greenwich, of which they have made me the humble instrument. A course of lectures on Naval Strategy and Tactics has been going on for three years there, and we are in the middle of a course now. A good deal has been said about the discharge of seamen as objectionable. Sir George Willes knows very well how often we have talked over the difficulties of that matter, but it is a matter chiefly in the hands of Captains of ships. If Captains of ships put men in a second class and send them to receiving ships in the second class, there is a difficulty in getting rid of them to sea, because you cannot send more than a certain proportion of them to any ship. These second-class men only grow worse and worse the longer they are kept in harbour, and ultimately, as far as my experience goes, it is from these men that the discharges chiefly come. It was a matter forced on us; it could not be evaded. The remedy is, I think, for Captains to avoid putting men into the second class as far as possible. The lecturer suggested that there were some speakers who did not possess even a latent regard for seamanship. I do not know whether he was at all referring to some of my efforts in that direction, but I think there is not a single naval Officer of the old school, that is, who have served in sailing ships, who could possibly fail to avow the strongest latent regard for the old seamanship. But what I am afraid of is that a great many Officers do not sufficiently suppress that latent regard, that they allow their sentiment to a certain extent to override their judgment. I was strongly struck with that myself coming up Channel as an umpire in the "Rodney" during the manoeuvres last year. When steaming at good speed we passed a most lovely ship, I thought one of the most lovely things I had ever seen in my life, one of the great liners to Australia, under sail close hauled on the starboard tack, everything looking just as it ought to look, every sheet close home, not a leach lifting, nothing wanting to please the eye and make one long that it might all come back again to the old life. But there we were standing in the "Rodney" beside the 67-ton gun, and what use was it? One could not help clinging to these regrets, to these beautiful ideas, but we must simply sit upon them and stamp them down. Because, after all that has been said to-day, what it comes to is that our men have to be trained, men and Officers, for that which they will have to do when war breaks out. If you tell me the best preparation for that is the training of the old school with masts and sails, and if you prove it—and I must be allowed to say that I think Lieutenant Lowry has come nearest to proving it of any of the speakers, because he has actually brought the training of sailors into the Gunnery Department, and he has shown as far as the figures go that these men turned out exceedingly good at their guns—if it be proved that the men trained as royal yardsmen, and so on, make the very best gunners, and that it is a necessary point of gunnery and fighting training, all I can say is the sooner we set to and train them all in that way the better. But the proof is, I am sorry to say, not sufficient, and we have to recollect what it comes to according to the lecturer's views. He wants all our seamen to be kept for three years of their twelve in sailing ships or masted ships. That means a navy by itself; it means 7,000 men always in masted ships? How much will you lose if you do that? But still, if it is certain the training mast and sail is a necessary beginning for the seaman of the present day, we must have it. Then I think we must go a step further. Although it has been stated that a great authority, Admiral of the Fleet Sir Thomas Symonds, wished that training ships for sail exercises should be steamers, I think if we are going to do the thing we had better do it thoroughly, and not have steamers, but regular good thorough-going sailing vessels, and nothing

else. If you are going to train the men and make them sailors of the old school, surely every instant you are under steam means so much loss to the seamanship. But to me there is a bigger question behind the whole of this, that we must not separate more than we can help the two great Departments—what the lecturer calls the Executive Department and the Engineering Department. There is no question that that vast separation at the present time is the greatest difficulty that now exists, and if we do not mind what we are about it is a growing difficulty which may overmaster us. For my part, although it is utopian to hope for it, perhaps, I think that our business is to use every nerve and every effort that it is possible to do to place the whole management of our ships in the hands of a single class, to get the propulsion of the ship and the fighting of the ship into one set of hands, and not into two. We are a very long way off it now, but I am afraid the more we hark back to the older style of things the more difficult it becomes to draw the two classes together and to amalgamate them into one, and the more remote is the time placed at which that happy result might be arrived at. As to the expense of keeping ships at sea under steam, I do not for one moment believe it. I most fully agree as to the necessity for keeping ships at sea. I think there is a great deal too much harbour, and with our seamen under our present system the point is not so much whether they have served in masted or mastless ships, but whether they have served at sea at all. When I was Captain of the "Duke of Wellington" I made that one of my studies, and was quite appalled to find what a very small amount of actual sea service most of our bluejackets had had. As to remaining at sea, that is the great point. To be away from land, to be away from boats and going ashore, for people to be thrown thoroughly into their ships and kept apart from everything else. When I was in command of the "Thunderer," a mastless ship, in the Mediterranean, I made it a practice to be as much at sea as I could. We used not to steam so much, but our practice was to lie sometimes for a week or ten days simply with fires banked. We used to enjoy it most thoroughly; so much was it enjoyed that it became the practice of the fleet; and several times did the fleet simply bank their fires up and lie at a good distance apart. You then had the opportunity of working up the whole training of your ship free from interruption, making everybody accustomed to her, going on with your training without any irregularity or wish to get ashore, or any pressure of time for the Officer's boat, and so on, but you had all the advantage with but very slight expense as to the expenditure of coal.

Admiral Sir J. C. D. HAY: May I say one word in corroboration of what fell from Admiral Sir George Willes? The evidence of Captain Shaw was so clear and conclusive, I think, as to the great loss of activity in the seamen of the Navy through want of training aloft, that I think the Report of the Committee before which he gave his evidence would be worth while any of my gallant friends here referring to. I happened to be a member of the Parliamentary Committee before which Captain Shaw was examined, and he stated that he could no longer take men from the Navy for the work of the Fire Brigade, but he was obliged to get them from the merchant ships, because the old recklessness aloft, which was the best of all training for nerve and gallantry, had entirely gone away from the Navy, and was only to be found in the sailing merchant ships. I recognize, of course, that our battle-ships cannot have masts, but by some means or other there should be a considerable proportion of their early lives in which both seamen and Officers should have that excellent training which gives them the best possible nerve that men can have.

Captain NOEL, in reply: I am much gratified with the support I have received to-day. I think in the case of almost every speaker, except Admiral Colomb, I have had more or less support. I only wish a few more of the *seamen* I see before me, who are looked upon in the Service as amongst the most reliable of our Officers, had risen to make a few remarks in favour of what we must consider the backbone of our professional knowledge, that is "seamanship." Seamanship I know is looked upon by the younger Officers in a somewhat different light to what it was in former years. I hold that seamanship is not necessarily the working of sails, but it is that knowledge of a sea-going life which can only be gained by constant sea-work, and what I contend in my paper is that we cannot get that constant sea-work without

putting our Officers and men into masted ships. I think Admiral Colomb has rather proved this for me. What he told us is that he used to take the "Thunderer" to sea, let her lie like a log on the water, sometimes for a week together. I would ask what seamanship experience was gained by any man or Officer on board by such a process? Why, even the experience of boating that he learns in harbour is denied him; he can, perhaps, do his gun-drill, his torpedo-drill, but what seamanship can he learn? The lead cannot be hove to take soundings, and a man is not even required to steer, and yet this is what is represented as seamanship training in lieu of the sailing of ships at sea. I am very glad that we have had views expressed by some of the younger Officers. I think Lieutenant Murray-Aynsley gave us a very nice little speech stating what *they* think of the matter, but I do not gather from what he said that he opposes seamanship. I dare say he would curtail the seaman's training rather more than is recommended in my paper. Lieutenant Lowry most thoroughly supports the view of training men as seamen, and I have had support also, I am happy to say, from higher authorities. Where my paper has been opposed more than in any other question is in the matter of making the Channel Squadron the squadron that will carry on the seamanship training. I was in the Channel Squadron some years ago when Admiral Sir Geoffrey P. Hornby commanded it. In those days we used to be under sail alone constantly; we would disconnect the screws, and the squadron remained under sail for three or four days at a time. I do not know why the same thing cannot happen now: surely the same ships are not more dangerous than they used to be. I purposely omitted, in the vessels I mentioned, some of those that cannot sail, the twin-screw vessels, for instance; but the "Minotaur," "Hercules," and "Triumph" classes are all fair sailors. I do not say that they should be taken in and out of port under sail, but still when they are at sea there is no reason why they should not be kept week after week under sail, and I believe some of them would do as well as some of the old line-of-battle ships. It is generally admitted that we ought to train our Officers and men to a sea life, and we are told we can do it in the new ships, but imagine a squadron of "Merseys," or some such new fast vessels, they carry very few seamen, and the only order the Officer of the watch has ever to give is "Boatswain's mate, pipe a hand from each part of the ship, up ashes." There is no ordering men about: there is no taxing the brains to know whether you are carrying on correctly in shifting your topsail, or some other evolution which is such admirable practice for both Officer and man, and in place of which (in mastless ships) I do not know what can be done. There is, in my opinion, plenty of time to train our Officers and men in the effective working of the new battle-ships. I do not despair of this at all if they are first made seamen, and they would qualify after a seamanship training in a third of the time that would be necessary if brought up in any other way. I am grateful to Lord Charles Beresford for his support: he has an independent voice with which at will he can gain the ear of the public, a power that always carries great weight. I only hope that he will thoroughly support the training squadron, and get it doubled, if he can. Of course I do not want masts and sails in battle-ships, but still if our Channel Squadron was used as it has been up to the present with masts and sails—and there I do not quite agree with Captain Johnstone, for I think they might be worked more under sail as they used to be—I contend that they should and could carry on the training of the younger Officers and seamen: they might be periodically brought home and turned over to the newer ships for some cruizing in the summer; we should then get a very fair amount of training in masted ships. I beg to express my most sincere thanks to Sir Henry Keppel for kindly taking the chair. It is a circumstance on which I may most truly congratulate myself that the gallant Admiral, who for so many years has been looked up to and esteemed as one of our most splendid seamen, should have come amongst us in his old age and show that he can still say a word for the old Service. I have no doubt presently he will do so. I thank you very much for the patience with which you have listened to me, and I trust that this paper and the discussion on it—which has been so well sustained—will bear fruits to the benefit of our Service.

The CHAIRMAN (Sir H. Keppel): I do not know, ladies and gentlemen, that I am called upon to add anything on this occasion. I have long been on the Retired List, but I have been very much interested in all that has been said on both sides.

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I am only an old salt, and have a very strong feeling that the naval education, the sea-going education, was always necessary for our Service. It is that that gives the sinew and strength to our men. I doubt whether the splendid men that now form the Navy would be the fine fellows they are had they not gone through a sea training. Above all they get that exercise of mind so necessary for every seaman that goes aloft. His life is in his hands. It is not like the sergeant of marines who drills men. The man goes aloft with his life in his hands, and he has to think before everything he does, and I maintain that is the training that the men want. The old school has passed away! I have now only to thank you for your kind attendance, and to say how much interested, one and all, we must have been in the speeches that have been made to-day, and in the lecture to which we have listened.

Wednesday, May 22, 1889.

GENERAL THE RT. HON. VISCOUNT WOLSELEY, K.P., G.C.B.,
G.C.M.G., Adjutant-General to the Forces, in the Chair.

RECRUITS AND RECRUITING.

By Deputy Surgeon-General W. G. DON, M.D., London Recruiting Staff.

The CHAIRMAN : I have to introduce to you Surgeon-General Don of the London Recruiting Establishment, who has kindly consented to give us the benefit of his experience in the recruiting service, a most important point in connection with an army raised entirely on the voluntary system. It will be followed by a discussion in which I hope those will take part who have experience in recruiting, or who have studied the question.

WHEN asked to lecture on Recruits and Recruiting in this distinguished Institute, I consented, in the hope and belief that my practical experience might add something to our knowledge of the subject, especially concerning its inner aspects and working.

I will avoid as far as possible alluding to methods and means employed in the past or at present to attract recruits under our system of voluntary enlistment; or reviewing the politico-economic aspects of the question; or discussing the bearing on recruiting of the military problems of long or short service; all these matters have already been fully treated by competent authorities within these walls.

The task I propose is to invite you to accompany me into the inspection room, and, while in direct touch with recruits and recruiters, view the inner working of a recruiting office.

From the following antecedents I think I can bring a good deal of experience to bear on the subject. When employed in the Medical Branch of the Director-General's Office, it was part of my duty to report and advise on the many appeals over disputed disabilities in recruits which were constantly passing through the War Office. Those who may have had a like duty to perform will readily recognize the difficulties of the position, inasmuch as recruiting disputes are not confined to matters of fact, but usually embrace wider questions of opinion.

To the varied but somewhat abstract and theoretical knowledge acquired in the War Office, I have since added an extended practical experience of four years in the London Recruiting District. During

that time I have personally examined nearly 20,000 recruits for all branches of the regular Army and for the Militia, besides being on the spot while nearly as many more were inspected by my colleague, Brigade Surgeon Gribbon. I am therefore able to speak with confidence on not a few points.

Most medical Officers during tours of home service of course see something of recruiting; but only a very few can or do have the advantage of studying it on the scale presented in London. That is by far the largest and most varied of our recruiting centres, not only having a gigantic population of its own, but sucking in, like a huge social maelstrom, all sorts and conditions of men, including at once many of the best and some of the worst of our provincial manhood. The great metropolis presents or reflects nearly every social and physical aspect of our nation's humanity, and in none more perhaps than in recruiting.

I intend to confine my remarks almost wholly to London recruiting, which, besides being within my own knowledge, is sufficiently large and varied to afford material for instructive generalization.

In addition to strictly personal and practical observation in the inspection room, I have there also had the advantage of being assisted by such honest and astute old recruiters as Staff-Sergeants Griz and Mister, non-commissioned officers who have been at the work for the past thirty years, and from whose ripe experience I have learned much. These men, and others on the Recruiting Staff, have, from daily observation during many years, naturally gathered an immense and curious fund of information connected with every detail of their duties. The insight acquired by our venerable recruiters is at once both interesting and valuable; it may lack both scientific breadth and exactness, but it takes a ready and firm hold of a recruit's individuality.

This leads me to ask, what is wanted in an Officer or a non-commissioned officer to make a thoroughly good recruiter? I would answer that, given of course personal intelligence and special aptitude, the most essential requirements are a thorough knowledge of the duties of every branch of the Service, combined with a large experience of the world-wide life led by the British soldier. Without such knowledge, those who enlist, those who pass, and those who post recruits will in many ways be working empirically, with the liability and result that square men will find their way into round holes, and *vice versa*. If these observations be correct, it follows that, as a rule, only the older and more experienced Officers and non-commissioned officers can be employed with full advantage on the recruiting service, and that, while recognizing exceptions, young Officers and men will be unsuitable, and outside civilians wholly unreliable. Of course young men as well as old can be found with exceptional aptitude for this as for other duties; nevertheless on broad grounds I think it most desirable that only tried and specially capable medical and field Officers and sergeants should be employed at all our larger recruiting centres; and, having found such men, I would give them large discretionary powers.

It is astonishing what diagnostic skill long training will bring to the eye merely. I know a most expert lame cattle dealer, who, from being unable to leave his cart, never handles, but judges cattle driven past him with unerring precision, as regards condition, quality, and weight, by sight alone. So, the apt recruiter in time acquires a similar eye for the human animal, and becomes educated visually so as to be able to estimate with much ready accuracy the measurements and physical quality of the naked recruit; he, in short, grows into an expert, and therein is his great value.

I would impress on you the especial value of expert medical examination, both in protecting the Service against inefficient men, and the State from much financial loss. It is, I think, a most mischievous mistake to imagine that any young army surgeon or civil practitioner is competent to examine recruits, merely because he is a medical man; the services of such inexperienced and untrained men may be cheap at the time, but will infallibly prove very dear in the end.

I have often thought that were it possible to give our young army surgeons a short practical insight into recruiting at our larger centres it would be of much advantage to the Service and to themselves. It would give a confidence which I know is often wanting when passing recruits on their own responsibility, and probably also prevent the rejection of eligible recruits whom the inexperienced examiner pronounces unfit through an uncertain and too literal interpretation of the Regulations.

During the past decade medical examination has become more exact and scientific; when I joined the Service it was indeed crude, superficial, and perfunctory. The thorough and skilful examination of a recruit is no mere mechanical formula like drill, but involves the expenditure of considerable physical and mental power. After two or more hours at the duty it is difficult to keep up the close attention and alertness of mind necessary in playing the part of a medical detective. It must not be forgotten that the recruit and the doctor are, as it were, pitted against each other, the one trying probably to conceal, the other to spy out, defects. It is a situation and an ordeal not altogether calculated to maintain amicable relations between them; against the recruit's stupidity or obstinacy, conscious or unwitting concealments, or even deliberate attempts to deceive, the medical Officer has to bring skill, patience, good temper, adroitness, and finesse. No small degree of physical and mental endurance is indeed required by medical Officers who have to examine a large number of recruits on end. I have been asked how many I could examine in an hour or a day. This is a question not only foolish but vulgar. It implies that professional work can be measured by the same standard as mechanical piece-work. In this instance it would involve a mere race of numbers against time, altogether without reference to the quality of the work.

It of course takes considerably longer to pass a man, take down all his marks, and carefully prepare his documents and records, than to summarily reject him; but I would certainly not expect even an

expert examiner, aided by the best clerical and other assistance, to pass more than six or eight recruits in an hour. Medical examination cannot be hurried without danger of important slips and mistakes.

It is astonishing how little is generally known of the nature or extent of the medical examination which a recruit undergoes. I have been asked, by those supposed to know better, whether we wholly stripped recruits. I imagine the female recruit who lately presented herself must have been profoundly ignorant on that very point!

I would ask you to believe that a vast amount of painstaking work is done by Officers and men engaged in recruiting, of a kind which never obtrudes itself publicly, and may be even not wholly known to their immediate superiors. For the expert medical and field approving Officers are like sentries on the portals of the Army, and by skill, discrimination, and vigilance, stop the entry of unsuitable or fraudulent men into its ranks: they are thus also truly guardians of the public purse. The importance of well done recruiting work may not always be fully appreciated or recognized; while the inevitable occasional oversights and mistakes are liable to be unduly magnified and too unbendingly dealt with.

With these general remarks, I would now ask your attention to some statistical and specific details of the recruits examined for all branches of the regular Army, and for several of the metropolitan regiments of Militia, at the great headquarter establishment at St. George's Barracks, London, which is by far the largest recruiting centre in the kingdom.

I take statistics for the past four years, 1885-88, inclusive, because I can speak from personal knowledge of the recruiting during these years.

I first direct your attention to the recruits for the regular Army, as shown in Table I.

The numbers inspected, passed, and rejected are shown year by year, with the percentage of rejections.

TABLE I.—*Recruits Inspected, Passed, and Rejected for the Regular Army at St. George's Barracks, London, for the Years 1885-88.*

Year.	Inspected.	Passed.	Rejected.	Per cent. rejections.	Average.
1885.....	6,149	3,227	2,922	47·51	
1886.....	6,314	3,345	2,969	47·02	
1887.....	5,017	2,709	2,308	46·00	
1888.....	5,997	3,111	2,886	48·12	
Total...	23,477	12,392	11,085		47·17

Average rejections on enlistment throughout the United Kingdom for same period,
43·42.

I first observe, in connection with this table, that it is the total inspected which represents the actual labour of the medical Officers

and sergeant recruiters; for the description and measurements of all recruits, rejected as well as passed, have to be carefully recorded and tabulated for the purposes of statistical analysis.

Statistics connected with these 23,500 men inspected are much more uniform and homogeneous than those presented by recruiting Returns from the country at large, inasmuch as the recruits were collected within the same area, by the same sergeants, and examined practically by two medical Officers only. The yearly totals are much alike; but that for 1887 was lessened by the efforts of a branch and rival recruiting establishment then in operation at the Tower, but now discontinued. But, although annual totals closely correspond, London recruiting is not uniform at all seasons, but is automatically somewhat brisker in winter and summer. I cannot say why, but I have the assurance of the oldest recruiters, that it does not seem to depend on slack trade, or want of work; for such apparently do not materially affect the steady flow of recruits within the metropolitan area.

In the manufacturing and industrial districts dull trade undoubt-
edly quickens recruiting, but probably influences recruiting in London
indirectly only; that is, by bringing about a somewhat larger enlist-
ment of country lads, who in dull times come to town seeking, but not
finding work.

The true London recruit, whatever may be his motive for enlisting,
seems in no great hurry to join; for he is easily distracted; all out-
door excitement, such as holidays, demonstrations, races, and sports,
at once and for the time being lessen or almost stop recruiting.

Not merely are different months slack or brisker than others, but
different days of the week likewise; the three first are always busier
than the three last; this is probably from the fact that men usually
finish up, or get discharged from work, at the end of one week, and so
are able to enlist at the beginning of the next. Although London
recruiting, like all else connected with such a great place, is of a
decidedly cosmopolitan character, and embraces men from every part
of the country and the world, yet quite two-thirds of the total recruits
are declared natives either of the greater metropolitan area or of the
districts immediately adjoining. From an analysis of the recruit
registers and annual Returns, and by striking averages, I find, as
shown in Table II, that of the total English recruits about 63 per
cent. belong to Middlesex and Surrey, 11 to Kent and Essex, and
26 to the rest of England and Wales. I need not say recruits do not
always give correct accounts of their birth-places, any more than of
their ages or employments; but in the great majority of instances
these particulars are doubtless given truthfully enough. It does
happen also that recruits born out of London belong to it all the same
from having been reared in it; but against such can be put the
undoubted country lads bred outside of London in the four home
counties named; placing these to balance each other, it may be
roundly estimated that London recruits are made up of 60 per cent.
urban and 40 country-bred. The numbers of Scotch, Irish, Colonial,
and foreign London recruits, although considerable, are relatively
small. The Colonial are largely the sons of soldiers born abroad.

TABLE II.—*Nationality of Recruits for the Regular Army inspected at St. George's Barracks, London, during four Years, 1885-88.*

	1885.	1886.	1887.	1888.	Total.
English	5,763	5,846	4,772	5,706	22,084
Scotch	139	169	80	118	506
Irish	189	219	85	115	608
Colonial and foreign	58	83	80	58	279
Total	6,149	6,317	5,017	5,997	23,477

Of English recruits, average per cent. from the following localities, according to declared birth-place:—

Middlesex and Surrey	63.57
Kent and Essex	10.97
Rest of England	25.46

} 100.00

London recruits are drawn from a greater variety of classes in the social scale than in provincial centres; yet, the proportion from the various classified trades and callings in recruiting Returns is much the same as in the country districts; the chief exception is a considerably larger number of the professional and clerk class.

As shown in Table III, half are drawn from the unskilled labour class; but the great term "labourer" is not only freely used but much abused in recruiting Returns; it is often applied simply in default of any other nameable calling, and I have known it assumed by a clerk, and even a professional man, to conceal identity.

TABLE III.—*Occupations of Recruits inspected during 1885-88, for the Regular Army, at St. George's Barracks, London.*

	Inspected.	Rejected.	Per cent. rejected.
1. Labourers, husbandmen, servants, &c. Proportion 51.31	12,057	5,324	44.14
2. Trades: bakers, tailors, shoemakers, printers, &c. Proportion 17.67	4,150	2,374	57.20
3. Mechanical employments: smiths, masons, carpenters, engineers. Proportion 15.66	3,677	1,934	52.59
4. Shopmen and clerks. Proportion 10.86..	2,555	1,195	46.77
5. Professional, students, &c. Proportion 2.20	492	153	31.09
6. Boys under 17. Proportion 2.30	546	105	19.23
Total	23,477	11,085	

A distinction is drawn in Returns between labourer and farm labourer, and it may excite surprise to learn that the latter term figures in London statistics. This is how it usually comes about. In autumn, or winter especially, it is not unusual for country bumpkins to present themselves in twos or threes from the same locality; when they do, poaching difficulties are generally at the bottom of the sudden migration; it is a joke of the recruiters to ask them whether they have not fled to London from the "pussy cat with the long ears!"

The unskilled class of carmen, carters, and van porters supply many good recruits in London; they are generally well developed and able bodied, probably from having originally been stout selected boys for the employment. The trades class, such as tailors, shoemakers, bakers, printers, and sundry indoor handicrafts, supply about 20 per cent., while the mechanics, such as smiths, masons, carpenters, and fitters, yield about 15.

But while many good recruits are obtained from these skilled classes, the ratio of rejections is very high, amounting to from 50 to nearly 60 per cent.; they largely suffer from varix, ruptures, spinal curvatures, general unsymmetrical development, and bad teeth.

Not a few, however, ranked under the trade or mechanic class are mere labourers, as when a recruit is described as a plumber, while he is only a mate, "carrying the fire."

The shopkeeper, clerk, and professional classes give a large number of very fine recruits in London, especially for the cavalry; not a few are gentlemen born and bred. The rejections are comparatively low, but many clerks are deficient in chest. When examining good specimens of this class, I have often said to myself, would that those who dwell upon the deterioration of our race were here, to see such splendid fellows in their natural buff!

The boys enlisted in London are mostly drafted from various industrial schools, but the majority, being sons of soldiers, come from the Royal Military Asylum at Chelsea.

I will now say something of the 12,392 men found medically fit: I emphasize the word medically, because it must not be supposed that all these men proved militarily fit; much may happen between the passing and swearing-in. After the severe medical weeding ordeal, successful recruits may still fail to satisfy the approving field Officers; their antecedents may be doubtful, or they may turn out positive frauds; or they may hold out for a corps not open; or they may simply repent, dress, and walk away. There is no hold on a man until he is finally attested, and often much waste occurs between being found medically and militarily fit; so, in the various ways I have indicated it comes to pass that the numbers recorded fit in the medical registers never do, and never can, tally with the statistics of the Staff Officer of those finally attested.

Elimination, therefore, is carried out in so many different ways, that less than one-half of the raw recruits brought forward by the recruiters ever become duly attested soldiers.

I now notice the medical rejections and the chief causes thereof.

The rejections on inspection at St. George's Barracks reached the high level of 47 per cent., as against an average over the whole kingdom by army medical Officers, during the same period, of about 44 per cent. The excess of 3 per cent. in London can be explained partly by the larger urban element among the recruits, but more, I imagine, by the greater strictness of the medical examination.

TABLE IV.—*Four chief Causes of Rejection at St. George's Barracks, London, during 1885-88.*

Total rejections, 11,085, of which from—

			Per cent.
1. Defective vision.....	1,201	....	10·84
2. Under height.....	620	....	5·59
3. " weight	1,401	....	12·62
4. " chest	4,479	....	40·40
 Total.....	 7,701	....	69·45

According to Table IV, no less than 70 per cent. of the total rejections are included under four causes only. If these causes be duly examined, I think the erroneous inferences which have been drawn from the high ratio of rejections in recent years will not only be corrected, but altogether dissipated. I allude to the theory that the increase of rejections is the result of deterioration and degeneracy in the population from which recruits are mostly drawn. Such an inference I consider an entire mistake; the raw material of our recruits is as good as ever it was; and this is not merely my own assertion, but the unanimous opinion of our oldest recruiters, who ought to know. It was the change of system, and consequent alteration in the Returns showing rejections, which produced the great increase. Up to 1879, the standard height, weight, and chest measurement in recruits was considered a military, and not a medical matter; the Adjutants and Staff Officers were supposed to be responsible for standards, but in practice it was left to the sergeant recruiters; height was fairly taken, but there was no fixed minimum weight, and as for chest, it was unquestionably most loosely dealt with; there was, in fact, every financial inducement to slur over standard measurements.

Since 1879 these measurements have, very properly, been made part of the medical examination, and the responsibility for them has rested on the medical Officers. This is as it should be; for, not only are correct measurements a most important and essential part of the examination, as I will explain when speaking of their correlation, but the medical Officer is altogether the most disinterested and competent official to make them. To be under standard, in short, was formerly a military, but is now a medical disqualification, and the effect of the change is well shown in the statistics of Table V. In this, I have selected three years preceding and three following the change, and the result is an average increase in the latter of 18 per cent. in the

total rejections, almost entirely from under standard measurements. Before 1880, it is true, medical Officers did have some means of rectifying standards by the rejection of evident weeds, from "Muscular Tenuity and Debility;" but rejections under this head are now merged in the much more exact term—"under weight." The high ratio of rejections for under standard has been kept up during recent years from several causes; when the rejection of a recruit involved the recruiter in direct pecuniary loss, there was care not to put forward palpable weeds; but now, when rejections involve little trouble and no pecuniary loss, less caution is exercised in the primary selection, and a large number of men on the very borderland of deficient standard measurements are pushed into the inspection room, on the bare chance of their passing on the responsibility of the medical Officer. Rejections are needlessly swollen in this way, and I am probably within the mark in stating that they might be lessened 15 or 20 per cent. by more careful primary selection. But I fully recognize it would probably be impolitic to limit the freedom of the recruiters too far in this respect; for it is better to have an explained high rate of rejections than that probably good recruits should be punctiliously turned away before they reach the medical inspection room.

TABLE V.—*Medical Rejections per cent. from all causes at St. George's Barracks during the following Years.*

I. Standards a military qualification—

1877.....	27.98	Average 28.97.
1878.....	27.94	
1879.....	31.00	

II. Standards a medical qualification—

1880.....	50.00	Average 46.87.
1881.....	49.83	
1882.....	40.79	

The responsibility of the medical Officers for standard measurements, and the far greater exactness with which these are now carried out, together with increased strictness and efficiency in medical examination, are the true explanations of the recent high ratio of rejections—not the inferred degeneracy of the recruits. It is curious to note that little interest was taken in standard measurements whilst it was a military matter; but the moment it became medical, then medical Officers themselves, commanding Officers, gymnasium instructors, and others, suddenly developed an interest, and even inquisitiveness on the subject quite remarkable. I feel perfectly certain this awakened interest has been in every respect for the good of the Army.

I will now look more closely into the four chief causes of rejection:

First, as regards vision. In the days of Brown Bess, when the British soldier was cautioned to reserve his fire until he saw the

whites of the enemies' eyes, good sight was of little value ; but now, every advance in long-range arms of precision makes acuteness of vision more and more important. Mere myopia or shortsightedness is easily detected and tested by the recruiter ; but there are other conditions of vision which require professional discrimination ; a recruit, for instance, will see three or four test dots at the required distance, but any greater number become mixed up and indistinct ; this indicates a limited accommodation, and inability to see objects out of a certain meridian or plane ; it is a defect, but not usually a disability, although many recruits are rejected for it. I mention this just to show that testing of vision is a scientific, and not a rule-of-thumb business. My own observation is that imperfect or defective vision increases as we ascend the social scale ; it is, on the whole, more common among the better than the lower class of recruits, and in town than the country.

Second, as to weight. To weigh a man ought to be within the capacity of any recruiter, yet we have many rejections on this score ; recruits are weighed outside the medical inspection room when only partially undressed, and enough allowance is seldom made for clothes ; this is corrected when they are put in the scales naked in the inspection room. From a physiological point of view weight for inches is of very great importance, as I will mention when speaking of correlation.

Third, as to height. Most people will, no doubt, say there can be little difficulty in ascertaining the correct height of a man under a standard arm, but in practice we find this is not so. The fact is, height in a young man is not an absolutely fixed quantity, but varies at times, and under conditions entirely beyond the voluntary control of the individual. It is generally greater in the morning than in the evening, and after prolonged rest in the recumbent position, simply from the expanded condition of the elastic intervertebral cartilages. Then, from voluntary muscular effort a tall man, particularly, can easily lengthen or shorten himself from a quarter, even to a whole inch. Height measurement is often vitiated from want of attention to small details ; half an inch out or in will result according as a recruit stands on the sides or flat of his feet ; or according as the spinal column is kept straight or not, or the chin down, by which the true vertex of the head comes under the standard arm. Many a needless and barren dispute as to a recruit's exact height has resulted from want of attention to minor details in measurement, as well as from ignorant non-recognition of the simple fact that, after all, the erect human body is a living structure liable to vary, and not a cast-iron column.

Fourth, as to chest. This has been a bone of contention, and the cause of more interminable recruiting disputes than all others combined. From the point I have now reached, after years of dark groping, I look back upon the vast mass of chest measurement disputes I used to come across in the War Office, as not merely altogether unnecessary and unprofitable, but very unscientific.

I believe that endless misunderstandings have arisen over the

really simple matter of chest measurement through striving after a minimum, which, if it exists at all, is only of theoretical and not of practical value. What is it we want to ascertain in measuring the chest? Just whether a well-developed heart and lungs are contained in a chest roomy enough for their free play. The thorax is not to be girthed like a rigid box, but measured as a mobile living structure, constantly varying its capacity by the action of both voluntary and involuntary muscles. I see no practical advantage in trying to find out its scientific minimum, unless it be to estimate its greatest range of expansion, for it is the latter which shows capacity for sudden or sustained effort, as in running, just as the highest boiler pressure indicates the full working power of a steam-engine. I consider that the extent of mobility is of more practical value than the absolute minimum or maximum of the chest, and so would estimate an expansion of from 33 to 36 inches to be as good, if not better, than one of from 34 to 36 inches.

The Army Instructions how to obtain minimum chest measurement are, that the tape being adjusted, the recruit is directed to count ten deliberately, after which, the lungs being emptied of air, the minimum is reached and can be read off. Even supposing this method theoretically sound, it is beset with much practical difficulty, for it assumes the recruit to be a willing co-operator in the manipulation, which he seldom or ever is. On enlistment the recruit is always ready and willing, nay, even proud, to display his full chest expansion, but struggles, generally with success, against showing its minimum. Now, taking advantage of this almost turkey cock pride, I think I can give a ready key to the true and natural—not forced—chest minimum.

From a vast number of observations, I reckon the maximum expansion of the chest of a man of average size, between 18 and 25 years of age, to be about 2 to $2\frac{1}{2}$, rarely 3 inches. Acting on this fact, we have for some years at St. George's Barracks applied it in a practical way in measuring the chest, with such success that our measurements are now seldom challenged. The method is as follows:—On carefully adjusting the linen tape (steel tapes are unhandy and unsatisfactory) over the point of the shoulder-blades behind and above the nipples in front, the recruit is directed to take a deep breath and expand himself to the utmost; this done two or three times, the maximum expansion is ascertained; we have then no occasion to engage in an irritating fight for the minimum, because we have already found that, by deducting 2 to $2\frac{1}{2}$ inches, according to the height and general physique of the man. The minimum and maximum are then recorded above each other, as $\frac{33}{5}$ or $\frac{34}{6\frac{1}{2}}$, as the

case may be.

I think if this simple and natural system were adopted, and the maximum and minimum recorded on documents, many of the absurd disputes over chest measurements which now take place would be altogether avoided and prevented.

I place no practical value on half inches out or in, and as for quarters, they are utterly absurd refinements in measuring, brought about by the slightest tightening or loosening of the tape.

The correlation of height, weight, and chest measurements are, as Sir William Aitken in his work on the development of the recruit has ably pointed out, of very great importance in estimating physique as a whole. Unless they are all in substantial accord, physical development is faulty. Sometimes, for instance, we find a fair chest with poor weight, which means bad development of the limbs; and again heavy lower extremities with very deficient chest, a combination not infrequent among clerks. Good weight for height is of the first importance, because without it there can be no really robust physique, however elegantly fashioned the different members may be. I am not thinking of weight from fat, for of that we see little among recruits, but weight from a stout bony framework well clothed with muscles. We do not take men for the regular Army under 115 lbs. weight at present, but I think this is a low minimum for lads of 5 feet 4 inches for infantry, and altogether too little for mounted corps. But as the majority of recruits at 115 lbs. are not more than 32 inches chest, and therefore under standard, they are rejected on that score. For mounted corps I consider the minimum should be 125 lbs., which would seem the lowest weight to give a cavalry soldier power at once to control his horse and wield his weapon, or a driver strength to manage a pair of horses. The height for artillery drivers has lately been lowered to 5 feet 3 inches, in the hope of thereby tapping a sturdy stratum of the population which undoubtedly exists at that height; but to catch suitable men, weight should have been raised to 125 lbs.; for the mere lowering of the height without increasing the weight will not secure the sturdy, but only open the door for stunted men. For nothing are strong lads more wanted than drivers. I have seen a driver obliged to struggle with a pair of restive horses until the skin was torn from his hands.

I think it can be amply shown that a close correlation exists between the physical and moral development, as seen among inferior races and the lower orders of men. Students in anthropology have long recognized it, both in savage and civilized countries. If it be true, then lowering the physical also means lowering the moral standard in recruits. I do not mean to imply that a short recruit has necessarily a "double dose of original sin," but rather that stunted growth usually means a low development of the nervous centres, and consequent deficiency in intellectual and moral power. We are bound to recognize the fact that a high standard of *morale* in an army is always associated with good physique. My friend Brigade Surgeon Beattie, Assistant Professor at Netley, a man of great observant powers, writes to me on this point as follows: "There is a close relation between steadiness of nerve and physical development; a soldier should literally have 'stomach for the fight.' If we dip too low for our recruits we shall be liable to get them not only small but unsteady, wanting in mental ballast as well as physical weight. The nerves and muscles are built up by the same process

of nutrition, and the weighing machine is the best of all means we have of testing the general fitness of a recruit."

I now pass to another point, and that is the motive which induces or impels recruits to enlist. Surgeon-General D. A. C. Fraser, when employed on the London Recruiting Staff some years ago, collected data on this subject which I have seen. I have not collected any in a formal way myself, but speak more from general impressions, obtained either through a little quiet cross-questioning, or from purely voluntary and confidential statements made by recruits of their own accord. I sum up reasons for enlistment under four heads, in the following relative order of precedence:—

1st. From choice; desire to be a soldier, see the world, and better oneself.

2nd. From necessity; want of work, or difficulty in re-obtaining it if discharged through some fault; sheer want.

3rd. Desire to leave home from domestic or social difficulty with family or friends, and especially sweethearts.

4th. Minor troubles with the law and the police.

In reference to law-breaking in general, I am often asked whether a large number of very bad characters do not enlist in London. Well, we do our best to prevent them if they try; but I think Colonel Henderson and the recruiting staff will support me in saying that the London recruit seems as law-abiding as the mass of his country peers. He is generally glib-tongued and often foul-mouthed, which does not enhance his outside reputation, but such faults are mostly on the surface.

But one thing is certain in the knowledge of all concerned, that very few true London criminals, or specimens of the habitual gaol bird class, ever venture near the recruiters; such men avoid and hate military discipline quite as much as police surveillance.

This leads me to speak of a class, not strictly civil but military offenders, who give much trouble in all recruiting establishments, and especially in London. I mean men who fraudulently re-enlist, either once in a way or repeatedly. Many such Frauds—and that is the best substantive name for them—attempt re-enlistment in London under the impression that they are more likely to escape detection in such a vast place than at out-stations and depôts; therein they completely err; for in London they but fall into the hands of the most experienced Officers and men, who make a study of recruiting and are thoroughly conversant with fraud in all its aspects. Through the kindness of Colonel Henderson I am able to show in Table VI the number of frauds detected during the past two years, in which records have been kept, at St. George's Barracks. They averaged 120 a year, but for every one of such at least three or four were baulked or prevented, making the total detected and suspected frauds probably 500 a year, which shows the extent of the evil. The detected frauds are those against whom direct evidence transpires, or who confess; the suspected, but who escape, are those against whom, while undoubted frauds, no legal evidence is forthcoming. At St. George's Barracks we pride ourselves in the prevention of fraud;

nevertheless it succeeds in a very small number of cases, as shown in the disallowances, that is, frauds detected within twelve months of being posted to regiments, in the second part of the table. Such men form a mere decimal fraction of the men posted from St. George's Barracks, but I am informed the disallowances against many recruiting dépôts in the country are very heavy.

TABLE VI.

Fraudulent enlistments discovered at St. George's Barracks, London, during—

1887.....	97	} Average 120.
1888.....	143	

Fraudulent enlistments not detected at St. George's Barracks, but afterwards discovered in regiments, and disallowed for :—

1885.....	14
1886.....	19
1887.....	40 (Jubilee pardon year).
1888.....	10

In London we have not only to contend against frauds from every branch of the Army, and from all parts of the kingdom, but against frauds from the Navy and Marines as well. The men who fraudulently re-enlist are almost wholly of four classes—deserters; men discharged as worthless; men discharged as invalids; and men in the Reserve.

I will give some account of these frauds as we find them stripped in the inspection room; and let me remark it is sometimes easier to spot them when dressed than when naked, and *vice versa*. It is very difficult to describe the appearances and signs which give rise to suspicion when an apparent fraud enters the inspection room. The experienced medical Officer arrives at a conclusion less by reasoning than by what may be termed an instinctive and unconscious cerebration. Conscience as a rule “doth make cowards” of frauds, and they almost invariably have a furtive look and manner; sometimes they will try to conceal a military bearing and knowledge of drill by overdone and over-acted awkwardness; they generally call themselves younger than they evidently are; are not very coherent in any account of their antecedents; and give a false birth-place, which speedily appears when a few simple questions are asked as to its geography and topography. When a suspected fraud enters the room we have signs and passwords which put all on the *qui vive*, and when he leaves, the sergeant-major and Staff Officer outside are put on their guard. Sometimes during examination giving a sudden word of military command will throw the fraud off his guard and cause betrayal of himself; sometimes he will scent detection the moment he enters the room, and endeavour to escape by pretending he cannot see the test-dots. But not a few frauds are just as wily and wary as their

examiners, and by dint of plausibility and audacity baffle all suspicion and get through. I have heard Officers say there could or should be no such thing as a fraud getting through ; such men can have no practical knowledge of recruiting.

As regards the detection of fraud through marks, there is a good deal to be said for and against. Re-vaccination marks when present are of undoubted value, for such can nearly always be distinguished from marks of primary vaccination in infancy. It has been proposed to effect re-vaccination in such a way as to thereby mark recruits for identification, but I think any such avowed object would be wrong, as tending to bring a most salutary operation into dispute ; besides, upwards of 40 per cent. of re-vaccinations either fail or leave no indelible marks. Birth marks, scars, and tattoo markings are all of value as means of identification, but they are often most loosely described.

I find that no less than 58 per cent. of the recruits passed at St. George's Barracks have tattoo marks of some kind or another. That shows the custom of tattooing is at once common and popular ; and I believe hardly a single man would object to have a Service device, such as a crown, tattooed on him after enlistment. The objection to marking by this means would come from humanitarian civilians, who choose to misname tattooing, and call it "branding."

When we come across elaborate tattooing, in which different coloured pigments have been used, whether the devices be oriental or not, such artistic work almost invariably indicates the bearer had been in Burmah or China. He may have been a merchant seaman, but is more probably a fraud from the Army or Navy. During the last two years a rather elaborate register of deserters and frauds has been periodically issued from the War Office ; we occasionally detect a fraud through it, but it embraces many thousands of names, and is much too vast to be of handy use ; besides, many of the markings given are of no value, being common to multitudes of soldiers. The register is also issued too much in arrear of desertions. The great bulk of deserters, if they attempt re-enlistment at all, generally do so within a very short time of their disappearance, generally within a few days or weeks. Staff-Sergeant Mister, who has devoted much attention to the matter, thinks publicity connected with deserters would be best attained by a bi-weekly issue of the "Police Gazette." The information therein given he thinks should be amplified according to the amended form shown in Table VII. He thinks information should be supplied regarding date and place, and by whom the deserter was enlisted, also the vaccination marks borne on desertion. This old non-commissioned officer's recommendations are founded on such long and accurate experience as to make them well worth consideration.

TABLE VII.—*Improved Form for use in “Police Gazette.”*

By whom enlisted.	Place of enlistment.	Place of birth.		Vaccination.		Desertion.		Marks and remarks.
		Right arm, No.	Left arm, No.	On enlistment.	On desertion.	Date.	Place.	
		Parish, town, or county.						

TABLE VIII.—*Militia Recruits Inspected and Rejected at St. George's Barracks, London, during 1885-88.*

Years.	Inspected.	Rejected.	Rejections per cent.	Average.
1885.....	2,957	1,188	40·17	
1886.....	2,419	984	36·52	
1887.....	604	213	35·28	
1888.....	2,847	858	30·13	
Total	8,827	3,243		35·52

I will now offer some remarks on militia recruiting. Recruiting was opened at St. George's Barracks some years ago for the Middlesex regiments at Hounslow, and lately for the Surrey Militia at Kingston, with the best results, although of course much increasing the labours of the recruiting staff. During 1885-88 a total of 8,827 militia recruits were examined, as shown in Table VIII, but during the greater part of 1887 recruiting was stopped. The average rejections were 35·52, against 47·17 per cent. for the regular Army; this is easily explained by the lower standard required and wider net spread. The minimum chest is 32 inches, and weight 110 lbs., while growing lads at these measurements under eighteen years can be passed at 5 feet 3 inches. The wider discretion given to approving medical and field Officers towards the militia works very well, and I should like to see a like discretion given towards recruits for the regulars.

Militia recruits are mostly drawn from the same classes as the line, but are younger and less developed; a large number enter with the avowed intention of joining the line the moment their age and standard will admit.

In this way the militia is truly a nursery for the regulars, and I think most properly so, although I am aware many are opposed to the system.

On an average of four years 523 men annually joined the regulars at St. George's Barracks from the militia. A very considerable proportion of these men had also joined the militia at the same place, so that we are able to trace them and note the effect of training. With this view I picked out fifty lads who during the past year had twice passed through our registers within three months. I made a limit of that period because it was short, and embraced the training of fifty-six days, and therefore fitted to bring into relief the actual effects of the training. The results are shown in Table IX, and I think are of a very satisfactory kind.

TABLE IX.—*Return showing Effects of 56 days' Training on 50 Recruits who enlisted into Militia and Regulars within 3 months.*

Average of days between enlistment, 69.

Average age, $18\frac{5}{12}$; oldest $20\frac{8}{12}$, youngest $17\frac{9}{12}$.

Average gain in *Height* during period :—

Maximum..... $\frac{19}{6}$ inch (2 men).

Minimum..... 0 " (15 ").

Mean..... $\frac{3}{6}$ "

Average gain in *Weight* during period :—

Maximum..... 16 lbs. (1 man).

Minimum..... 0 " (1 ").

Mean..... $5\frac{1}{2}$ "

Average gain in *Minimum Chest* during period :—

Maximum..... 2 inches (1 man).

Minimum..... 0 " (6 men).

Mean..... $\frac{12}{6}$ "

Average gain in *Maximum Chest* during period :—

Maximum..... $1\frac{1}{2}$ inches (3 men).

Minimum..... 0 " (5 ").

Mean..... $1\frac{1}{6}$ "

The broad conclusions to be drawn from such figures may be recapitulated thus :—

Many growing lads of about eighteen years of age, ambitious to be soldiers, but unable to join the regulars straight away, take a training in the militia, and through that are so improved in physique as to be able to enter the line at once on its completion. The good effects of militia training are not only physically but morally evident in the vast majority of cases. Not only is weight and chest, and even height, increased, but there is a marked improvement in general smartness and intelligence, as well as in sense of cleanliness and self-respect. Such indeed are the manifest advantages of a two months' training that I think even a peace philanthropist, did he but know it, might rightly wish the militia made a great school for the improvement and elevation of the masses.

From a recruiter's point of view the militia is a most excellent stepping-stone and real adjunct in recruiting for the line. Recruiting for both branches should, I think, always when possible be conducted together, hand in hand, and under no circumstance carried out in any kind of rivalry or antagonism.

We find, for instance, almost every day that a recruit under standard for the line there and then joins the militia when it is pointed out to him that it is the proper thing to do in order to make

himself bigger and stouter. But for dual recruiting carried on in this way in the same place, such recruits would probably be lost to both branches.

I always feel, in examining a militiaman who has gone through a training and is joining the regulars, that I am handling a man already raised above the level of the raw recruit; a ready made and potentially efficient soldier, not likely to repent and give the trouble which repentance brings, for a large number of recruits join the militia experimentally to see whether they will take kindly to soldiering or not.

I find I have reached the limits assigned to papers like this. My remarks have necessarily been somewhat discursive, but I trust, nevertheless, have conveyed some information not usually readily attainable.

If my observations should bring about certain alterations, which I think would be improvements, in the Recruiting Regulations, I shall be satisfied.

Major-General DASHWOOD: My Lord and gentlemen, I should like to offer a few remarks as to the inducements which are offered to recruits to enter the Service. As far as the daily pay of the soldier goes, I do not think it should be altered, but with regard to other advantages besides the pay I think a great deal might be done. I allude especially to the employment of the soldier after having left the Service. At the present time the authorities do very little in this way at all. The corps of Commissioners, I believe, is entirely self-supporting, so also are the registers at the brigade dépôts for the employment of soldiers, which, however, have not been altogether a success, because you cannot get employers of labour to employ a soldier instead of a civilian where the civilian is the better man of the two. The soldier may have got rusty at his craft, if he formerly learnt one, or he may be liable to be called upon as a reserve man to leave his work, which would be inconvenient; and, therefore, you cannot expect employers of labour to select a soldier as against a civilian if so doing would be detrimental to their business, because they would thereby be suffering an indirect form of taxation, which we have no right to call upon them to do. The reason why the Government hitherto have never done very much for securing berths for men in the enormous number of places for which soldiers would be available is that it would mean a sacrifice of patronage, or, as it is very often, jobs. Not very long ago an old soldier employed at one of the public offices, a man with several medals, happened to die; he was replaced by a very imposing looking individual, who was asked by a gentleman connected with the office how long he had been in the Service. The man replied twenty years. "Oh," he said, "what corps were you in?" The reply was, "I was twenty years butler to Mr. Ward Hunt." Not long ago a friend of mine told me of another case of this description in which, on taking over an office, he was recommended strongly to keep a man in the same employment. However, he found out that this man, so far from being a soldier, had been footman to some Commissary-General. In this case I am glad to say the footman was sent about his business, and in his place an old soldier was substituted. There are, of course, a large number of berths which Government might, if they liked, and if people would be willing to do away with patronage, give to soldiers. There are a number of berths, for instance, in the Customs, Post Office, and public offices; if all these were reserved for soldiers, and, in fact, it was ordered that no man should be eligible to hold any of these situations unless he had served six years in the army, that would be a very great inducement for men to enlist. A man would know then when he was recruited that if he served six years and was well behaved, he would have a pull over a civilian. Now it is rather the other way, because very likely when he leaves the Service he is rusty at his trade, if he has one, and the mere fact of his being in the reserve, and therefore liable to be called

out, is detrimental to him. I do not know whether I am out of order in talking a little further about the conditions of the Service, but there is another matter that I think is very detrimental, and that is, it says that a man may be allowed to re-engage for certain terms of service up to twenty-one years. I should like to see that word "may" replaced by the word "shall," provided he is medically fit and is recommended by his commanding Officer, because soldiers are not fools, and they know when the word is "may" that, supposing something was to happen and the clouds were very clear on the political horizon there might be a reduction of some sort, and he might be thrown suddenly on his beam ends. Further, when a man re-engages for a term of service from six to twelve years, and from twelve to twenty-one years, he should have an increase of pay, and deferred pay should be done away with. Deferred pay now merely acts as an inducement to leave the Service, and not to re-engage. Of course we do not want every man to re-engage, but still what happens is, a reserve man leaves the Service, gets his deferred pay, and soon becomes penniless; he cannot come back to his own regiment unless he pays back the money, and the result is he fraudulently re-enlists in another corps. I should also be in favour of all men serving either in the reserve or with the colours for twenty-one years, and at the end of forty-two or forty-three years, or some such age, he should receive a deferred pension according to the time he has served with the colours; that would be a retaining fee, and would keep him in the reserve. At the present time we are told very often that there are very few men in the reserve, when they are called out, who do not come forward; at the same time there are a number of men who are not in receipt of reserve pay because they have given it up altogether, and have gone to the Colonies or the United States. Under such regulations a man would know that at all events he would not end his days in the workhouse, which many a good soldier comes to at the present time.

Brigade-Surgeon MYERS, Brigade of Guards: I think Surgeon-General Don has scarcely done himself justice as to the work performed at St. George's Barracks with regard to recruiting. If one looks at the tables it would appear that there is only a difference of about 4 per cent. between the rejections at St. George's Barracks and the rejections throughout the Service. It struck me since I have been in this room as very remarkable that there should be such a small difference. No doubt, as he says, there is a tendency for weak recruits to try and join in London, and that might almost alone account for the difference. It must also, however, partly arise from the fact that there is a more careful examination. Now in such a department, with such an enormous number of recruits passing through their hands, the recruiting staff must have immense and most valuable experience, and therefore it seems rather difficult to understand how it is that there is so small an apparent difference between the average rejections there, which might be credited to greater care, and the general average of rejections throughout the country. I should like to ask Surgeon-General Don if he has made any inquiries into the amount of losses of recruits during the first three months, because we all know that ominous yellow form which is used for the discharge of recruits under three months' service as unlikely to become efficient soldiers. I believe, but I do not know, that those men who are discharged under three months as unlikely to become efficient soldiers, come under the term "rejected recruits," although they do not appear in the statistics brought forward by Surgeon-General Don. They are not invalidated. I fancy if the statistics were worked out, Surgeon-General Don and his colleagues might find a much greater loss of recruits "under three months" passed out of his district than in it. I should also like to know what is the loss to the Service from other reasons than medical during the first three months, because it is an extraordinary thing that in every hundred men fifty practically are lost in this first examination alone. What is the loss beyond that? I wish to come now to another point where I must differ from Surgeon-General Don. If there is one thing a medical Officer ought to be able to do, young or old, he ought to be able to examine a man and know whether he is healthy or otherwise. I admit that experience will enable you to form an opinion almost at first sight, which perhaps a young man might not be able to do, but still if a medical Officer cannot tell whether a man is in good health or not he is not fit for the Service. I was sorry almost when medical Officers ceased to have to pay for inefficient recruits. I think as to some recruits I have seen brought before me at the dépôt

at Caterham, that if I had been in authority I should have made the medical Officers pay for them, because they could not have examined them properly or they would not have passed them. They have signed papers, but they could not have examined them, or if they had it was done with their eyes shut, but I should add that such instances have been rare. With regard to the measurement of the chest of recruits, I venture to think Surgeon-General Don does not read the Medical Regulations as they are intended to be read. He says, "The Army Instructions how to obtain minimum chest measurement are, that the tape being adjusted, the recruit is directed to count ten deliberately, *after which, the lungs being emptied of air, the minimum is reached and can be read off.*" I do not think we quite agree on that point. I maintain that the Medical Regulations never intended that the minimum chest measurement should be taken. The wording is not that. It is to this effect: "The recruit shall count ten slowly, and the minimum measurement shown by the tape while so counting is to be taken." That is a totally different thing from saying that the minimum chest measurement is *reached* and is to be taken. If any one of you like to expand the chest to the fullest extent, as the recruit generally does if told to count ten, you will find you can count ten without the slightest contraction of the chest, and you can count twenty without another inspiration, so that I think it is clearly intended that a man's normal chest measurement should be taken, not the minimum chest measurement, but the minimum measurement after the man has counted ten, which is a totally different thing. If a man can ordinarily count twenty at one inspiration, then the minimum recorded at ten would be about the normal chest measurement. Surgeon-General Don's suggestion, however, of taking the maximum and the minimum, and hitting off the medium, is a most practical one. Few men can measure chests exactly the same, you want a practical man to do it. The words of the Regulations are very carefully drawn up; and it would be difficult to describe more clearly what is required according to the method adopted. With regard to re-vaccination, I cannot think that there should be so large a proportion of failures as 40 per cent. I have re-vaccinated some thousands of recruits, and certainly I hope my failures were not nearly 40 per cent., at least I do not believe so, and I should like to ask Surgeon-General Don whence he obtained his statistics on this point.

Brigade-Surgeon G. C. GRIBBON: My Lord and gentlemen, I do not think I can let pass this opportunity of expressing my hearty concurrence with all that my colleague, Deputy Surgeon-General Don, has said. Working with him in the same area, I think he has given you a most excellent paper. However, I do not wish to occupy your time with remarks of this sort, but shall pass on to one point, in which he speaks of the class of clerks. He says that many clerks are deficient in chest measurement. Now my experience of clerks is this, that they are either very good or very bad. Certainly the bad ones are very deficient in chest, but we get extremely good ones, very superior fellows indeed, and I must tell you my impression that these in nearly every case belong to the volunteers, which I think shows what value military training is to that class. After a day's work with his chest over a table writing, there is nothing better for a man than to go in the evening to the drill shed or parade ground and have his chest well thrown out. The deterioration that Surgeon-General Don speaks of here I apprehend refers to the town lad now and the town lad of the past. There is no doubt that as cities grow, and the open fresh air of the country gets further and further off from the densely inhabited portions, there will be a tendency to deterioration in the denizens of those parts who pursue indoor occupations, but in opening up air spaces in large cities, their lungs, so to speak, in the improved workshops and dwellings, in the shortened hours of work, and the greater devotion of the lower class to outdoor recreation, such as cricket, &c., we find, I think, that there is a sufficient counter-action to this tendency to deterioration. Comparing the town lad and the country lad, there certainly is a distinct difference between them, and we know in the recruiting office a country lad immediately he comes in. He is so very different from a town lad. His bones are large and thick, and they have a good covering of muscle, and his heart acts quietly, whereas in the town lad the bones are smaller, and he has not infrequently a want of symmetry in the legs, and perhaps some slight deformity in the bones as well. There is one thing especially characteristic of the town lad, and that is, that his circulation is worked at high pressure, so to speak. Among the lower city classes

there is a tremendous wear and tear of the nervous system, and this must necessarily lead to its being prematurely worn out. That is an essential difference between a town and a country lad, and I think one great cause of this undue wear and tear is the late hours the lower classes in the towns keep. There are the attractions of music halls, &c., to keep them up late. On the other hand, the country lad has nothing to do of an evening, and so goes to bed early. There is only one other point to mention, and that is the order of precedence as regards the reasons of enlistment. I think I should put first, necessity or want of work. My experience is that this is really the first cause. The fellows who come to us want a square meal, and board and lodging; that is the first thing they want. I think as regards Brigade-Surgeon Myers's criticism about the measurement that it is a mere verbal one. No doubt the minimum, as expressed in the Regulations, is the minimum after the ten is counted, and that practically is the mean measurement. The minimum measurement of course, strictly speaking, is when the chest is empty of all but the residual air, which you cannot get rid of, but Surgeon-General Don, as it seems plain to me in his remarks, takes the expression from the Medical Regulations, and uses it with the meaning attached to it there, i.e., as the practical minimum or mean.

Lieutenant-General Sir R. BIDDULPH: I should like to make a few remarks in consequence of my having had something to do with these matters for two years, though that is now past. I think that what Dr. Don has suggested in regard to the chest measurement is extremely valuable, because it will be found practically, if I may say so, that it is one of the greatest difficulties to get two doctors to agree in a chest measurement. During the time I was Inspector-General of Recruiting there were many such cases which were sent up to Headquarters, and recruits were sometimes rejected on that account. I agree with Dr. Don in saying that when they go into the refinement of a quarter of an inch in chest measurement it becomes absurd, because nobody can measure exactly to within a quarter of an inch; the recruit can alter it himself. But I think what he has said about taking the maximum, and then allowing a certain reduction in order to get the minimum, is the best way of doing it. From the experience I had in that office I found that most objections used to come from Officers who had not had practical experience in recruiting, that is to say, from Commanding Officers who perhaps had recently returned from India, had been out there a great many years, and had never had anything to do with recruits, because the men who go out to India are not recruits; it is by these Officers that objections are more generally made. The discharge of recruits under three months' service is a very important matter, and one to which the greatest attention was always directed in the office. No doubt there were a certain number of men pronounced unfit before the three months had expired; but the majority of these men were men who enlisted under the regulation which allowed men to be taken a little under the standard if they were promising. There was a regulation issued in the beginning of 1886, just before I joined the office, by which a certain latitude was allowed, so that they might take men a little under the chest measurement who appeared to be growing lads. Commanding Officers always had great prejudice against those men, and when that order was cancelled in 1887, in consequence of our having a perfectly sufficient number of recruits without them, the number of three months' rejections dropped immediately. I think I mentioned it in my Recruiting Report for the year 1887, and I did so in consequence of the statistics that I received. There is another thing with regard to the militia recruits which I should like to mention, and that is, I think the latitude given by the Militia Regulations for enlisting men under the standard is very often rather abused. They read the regulation as allowing recruits to be taken not merely under standard of height and chest measurement, but allowing them also to be taken under age. Some Commanding Officers in the militia and some recruiting officers have practised that. The reason I object to it is this, that many of these young men join the militia with a view of trying how they like soldiering and going into the Army afterwards, and if they are taken under seventeen they cannot go into the Army for more than a year afterwards. What is the result? They know that they cannot pass from the militia to the line *bona fide*, so, in order to get into the Army, they must desert from the militia and enlist in the Army as recruits, stating their

age to be eighteen. It is a great mistake to allow anyone below seventeen to join the militia; there should be no latitude whatever. I do not know whether recruiting officers who have had to deal with this practically have come to the same conclusions, but that is the one I formed myself—that men were enlisted between sixteen and seventeen under that regulation. I do not know that there is anything else that I need particularly say except that I agree with Dr. Don as to the very great importance to be attached to weight. Of course the minimum of 115 lbs. for all recruits is an absurd minimum if you are to take a Life Guardsman or a heavy cavalry man, because he ought to be a great deal more; but I apprehend the time will come when we shall have a more regular restriction as to weight, in the same way as we now have for chest measurement. At one time there was only one chest measurement for all heights. We have got more particular now with chest measurement, and I apprehend in course of time we may get more particular with weight, so that certain heights shall entail certain weights. That is a matter which requires medical experience, and it is not a matter on which those who are not professional men can very usefully lay down any general rules.

Major DAVIDSON, R.A.: Surgeon-General Don has alluded to the excellent work done by the Medical Department in getting our recruits. At the same time he alludes with considerable praise to the militia as a nursery and a schoolroom for our recruits. I think the question of getting our recruits from the nursery might be extended to a very great extent. What we want is habits of steadiness, seeing that our men have to use quick-firing arms. I think Mr. Stanhope in his speech on the Estimates said that we were going to build new barracks as depôts, and so on, for a number of regiments in the country, and I question whether the system which has answered so admirably in the Navy should not be extended to the Army, and that we should, as the Navy do, get our recruits as boys and train them on ships. This is essentially a maritime country. A boy trained on a ship would learn to row, knot, and swim; such training would be the very best for a soldier. A ship would be the best possible school for such boys, and I would suggest that nearly all our seaport towns should have depôts of boys from fourteen to eighteen years of age being trained for the service of their country. This would do away to great extent with the expense of the Recruiting Department and medical examination. Surgeon-General Don has shown you what a tremendous increase both in moral and physical growth takes place even in three months' militia training, and says that "even a peace philanthropist would, I think, hardly wish a better school for the improvement and elevation of the masses." Such a training has been proved to be almost self-supporting if run on proper lines, and it seems to me that the employment of our unserviceable ships for such purposes would be the cheapest thing, and the best means of ensuring discipline. I only throw out this suggestion, as Surgeon-General Don referred to a nursery for the regulars, and I believe it would be a most valuable thing for the Army and the country.

Major BARRINGTON FOOTE, R.A.: My Lord and gentlemen, I had no intention of entering into this discussion at all. I had not read the lecture before coming here, but as most of the discussion has come from those who supply recruits, I thought I might be allowed to say a word as a receiver of recruits, that is, as a regimental Officer. With regard to a town recruit and a country recruit, in my humble opinion, from the experience I have had, there is no comparison at all as to which is the better man of the two. Personally I hail with the greatest delight a thorough good countryman as my working gunner or driver. There is no question about it, he is in a more healthy condition, his muscles have been very much better worked, and altogether he is a more capable-bodied man than the average town recruit.¹ The depôt I am supplied from is at Newcastle. The recruits from there are, I think, a little weedy and pale-faced, many of them having been employed in mines, and they are certainly not in any way up to the average physical form of the few country

¹ I believe that for many years past, and indeed at the present time, the vast majority of the recruits for the Brigade of Guards come from the country; splendid able-bodied men, a certain proportion of whom become non-commissioned officers of whom any Service in the world might well be proud.

recruits that I got before, when I was at Aldershot, up to last summer. I was lucky enough to get a great many recruits from the country round. Now that I have gone to Woolwich I get none of them. The whole supply to my battery, which has been rather large within the last few months, has been from town recruits, and my opinion is that they are nothing like so capable as the country ones. Statistics show that the rural population is gradually disappearing, not very rapidly perhaps, but still the tendency of the people of England is to congregate in the large towns, so that, looking ahead, in a certain number of years we shall have apparently nothing but town recruits, and therefore the average man in the ranks—according to the arguments which we have heard this afternoon—the average run of men in the ranks will not be so capable as the average at present, unless of course we recruit under an entirely different system. There is one great thing within the last certain number of years which tends, I think, to make the working man less capable-bodied than formerly, and that is steam. I attribute the absence of steam, more or less, from his daily work as the real reason why the countryman is stronger than the town man. The latter has very little opportunity of using his muscles, and his body is not in such a healthy state, because instead of using his body he simply has to look after some steam management: he very seldom walks; railways take the place where ordinary roads used to exist. People in England used to be able to walk 20 or 30 miles, and think nothing of it; but nowadays there are very few who think of taking much walking exercise. If we were to take the whole of the men that one receives as recruits, and start them off suddenly—of course they improve afterwards—most of them would be really incapable of taking a thoroughly long walk. They do not walk nowadays, they go in the train; they do not work much with their arms or chest and improve their muscles, because of the introduction of steam. I take it, with the collecting together of all the inhabitants of England in large towns, and also the general introduction of steam and mechanical aids, that looking on a few years hence some other means will be required to supply capable-bodied men. We call our Army a voluntary army, but it is hardly that I think. I quite agree with one of the speakers, who said that the primary reason why men enlist is because they are in want, because they are in a state of hunger, and because sometimes they have fallen out with their employers, or are in want of employment. You can hardly call that a voluntary army. It is true they are not compelled to become soldiers, they are not seized upon physically, but they are practically compelled because they are in want, and have no work elsewhere. So I say that this, added on to the deterioration of physical power by men living entirely in towns and not in the country, it would appear to me that although we may be in a satisfactory state at the present moment, that if we look on a few years hence some other system, and possibly scarcely what will be called a voluntary one, will be necessary to keep our ranks supplied with men who shall be sufficiently capable-bodied, strong, and able to carry arms when required.

Surgeon-General DON: I thank you very much for the attention you have given to my paper, and for the kindly criticisms that have been passed upon it. At the outset I said I should not discuss the politico-economic aspects of recruiting, and therefore I do not propose to offer any observations on the last speaker's remarks; but I quite agree with him that no doubt the use of mechanical aids, steam, &c., has lessened the necessity for muscular hard work, and for the employment of the muscles, and has thus no doubt tended very considerably to deteriorate the physique of our workmen at large. Now, passing these points, I would reply to my friend Brigade-Surgeon Myers—it is not the first time I have discussed chest measurement with that gentleman. He says it is astonishing there should be only a difference of some 3 or 4 per cent. between the total rejections in St. George's Barracks and the rejections throughout the country at large; and he asks why that should be. But the difference of 3 or 4 per cent. is a considerable difference, and I suppose it is because we have got a little strict, indeed, we have to be more strict in London than in some of the country districts. Still the rejections at Liverpool, for instance, as I have been informed by the Officer commanding there, and in Manchester, and elsewhere, are really also high; but the generally high ratio of rejections in the urban districts are statistically diluted, so to speak, by the lesser number of

rejections in the country districts. Brigade-Surgeon Myers asks whether I included in my comparisons the losses during the first three months after enlistment. I have not. I purposely compared the proportion of rejections on primary examination only by the Medical Officer at St. George's Barracks and throughout the country at large, because I found that the secondary rejections of recruits passed by civilians were so high that, if included, they vitiated the statistics of total rejections throughout the country. If you include the three months' losses and the secondary rejections after examination by civilian surgeons, the actual total is over 63 per cent. I think if Brigade-Surgeon Nash were here he would confirm me in this; then he disagrees with me in laying emphasis upon the necessity for selecting medical Officers as recruiters. I think if there is anything you ought to select a man for, it is recruiting; whether he be sergeant, or Field Officer, or Medical Officer, anybody, in fact, connected with it should be men of large views and large experience. A number of young Medical Officers have told me that they are often in a funk examining recruits, fearing they would be severely overhauled for making mistakes, and they look out for a medical cause of rejection first, if possible. In St. George's Barracks we fear nobody, because we know that if we are right we shall be supported. We do not primarily look out for medical objections, but first measure the recruit, and if he does not come up to standards reject him on that score. Our total rejections for "defective vision, under height, under weight, and under chest," for the four years from 1885-88 were therefore nearly 70 per cent., whereas throughout the army at large they were only 28, that is to say, we reject 2½ times more for under-standard measurements than generally throughout the country; but our total rejections are only 4 per cent. more from all causes. I think I shall stick to what I have said, that you ought to employ your most experienced and best Officers in the recruiting service. About re-vaccination, he wants to know where I got the statistics. I worked them out myself, about ten years ago, for Sir William Muir, when the question was asked in the House of Commons. I found that up to 1874 I could get in the Blue Book the results of re-vaccination, and that 40 per cent. either were total failures or showed no indelible marks. I think, therefore, I am right in saying 40 per cent. of re-vaccinations are failures.

Brigade-Surgeon MYERS: That was prior to 1874.

Surgeon-General DON: Yes. I entirely agree with what Brigade-Surgeon Gribbon said as to town lads and country lads. As to the minimum chest measurement question, the Regulations distinctly lay down that the minimum is obtained after counting ten; there is no mistake about that. I have had a great deal to do with the Regulations, and I know the word "minimum" is employed in the exact sense stated by Dr. Gribbon, which is, that it is to be estimated after counting ten. I do not care a fig for a minimum so obtained, because I think it is of little value; it is more nearly a mean than a minimum; I can count twenty and fix my chest all the while. But if you say to a man, "Blow yourself out," and so take the maximum measurement, and then deducting the 2 inches or 2½ inches you obtain the true minimum you want. It is well known that one of the first signs of phthisis—of consumption—is the want of expansion, the want of elasticity of the lung. I agree with everything that Sir Robert Biddulph said. There are very few General Officers more capable, from his great experience, of passing an opinion. I agree that a greater number of objections to recruits have come from those who have had the least experience in recruiting, especially from Commanding Officers who have spent much of their lives in India, and find themselves at home suddenly in a new state of things altogether. The fact is, objections as a rule are raised by the least experienced Medical and Commanding Officers. General Biddulph attaches great importance to weight. I attach very great importance to it. I think all who have had any practical experience in passing recruits will attach more and more importance to weight. I do not mean weight from fat, because among recruits that very seldom enters into the question. However, weight for inches, weight for height, weight for chest, chest for weight, height for weight, must all be in proper correlation. A man with good weight of limbs, even if the chest is a little deficient, is likely to do well in the Service; but I have never yet known a man with bad limbs to work well. He cannot march and cannot ride; he cannot hold on the horse. I agree with much that Major Barrington Foote said with

regard to town and country recruits, and the necessity of training boys for the Army as for the Navy. Some of our best recruits are boys brought up in asylums and elsewhere; they turn out good soldiers. Then about the question of choice and necessity. I give simply my own impression in that matter. I have no direct statistics to show whether recruits as a rule enlist more from choice than necessity; but the great majority put choice first. Of course there are a large number who want a "square meal," but they are not the best recruits. I prefer the fellow who comes of his own free choice. As I said when I began, I purposely abstained from going into the economic and political aspects of recruiting, because it is not quite in my line. It has been discussed here, we know, several times over, therefore I spoke of what I thought I had some right to speak about, that is, my own part of recruiting duty. I thank you again, my Lord and gentlemen, for the kind way in which you have received my paper.

Lord WOLSELEY: I think, gentlemen, we have all listened with very great pleasure and interest to the remarks that have been made upon the lecture as well as the lecture itself. As Dr. Don tells us, the lecture was essentially one upon recruiting business and the business of the Recruiting Department. Designedly, he did not, therefore, touch upon those points which have been referred to by several of the speakers as to the inducements that ought to be held out for men to enlist in the Army. But I should be very sorry if those whose opinions upon our system of recruiting might be formed by what they have heard here to-day, should go away with the idea to be gathered from what has been stated by one or two speakers, that the great bulk, the large proportion, of men who join the Army at the present moment join because they are in a state of starvation or want. I deny that most emphatically. I have no positive statistics to give you on the subject, but I see great deal of the recruits of the Army when I go from time to time to various stations. From what I then see of our recruits I consider them to be a healthy, good-looking lot of men, and infinitely superior in every way, morally and physically, to the recruits of ten years ago, and, above all things, of twenty and thirty years ago. I attribute the improvement to two causes: First, because I believe the Army has become a far more popular institution than it ever was before. Men are now proud of being soldiers, and the great superstition that existed in former days against men enlisting in different parts of England is fast disappearing. I attribute it also to the fact that much greater care is bestowed upon recruiting than used to be done when I entered the Army. At all recruiting stations in England, and if I may venture to draw a distinction I say particularly in London, there is a great earnestness brought to bear upon recruiting work, both by the Officers in charge, and still more especially by the Medical Officers who have to inspect and pass the men. I do not think it is at all necessary that I should allude in any way to the various topics which have been touched upon, such as the employment of soldiers after they have left the colours and the question of deferred pay. Those are large questions, which have, as Surgeon-General Don has said, been dealt with and touched upon by many who have spoken in this theatre upon previous occasions. But I would merely say that, in common, I am sure, with every old Officer who is present here, I for one would hail with great pleasure indeed any arrangement by which a larger proportion of the public offices in this country were reserved exclusively for soldiers. And, what is more, I believe if there was an earnest wish, an earnest desire on the part of the public of England, and on the part of the Parliament of England especially, that it should be done, it could be done with the greatest possible ease. I believe if instead of all this talk which has taken place for many years back upon this subject, any man in high position who had the power to do it, was given a *carte blanche*, it could be done with the greatest possible facility and advantage, but till we have some one central department, some one central office to which all men requiring employés for the various branches in the public service had to apply, to obtain men,—till that has been established, I do not believe we shall ever obtain what we want in that respect. I am very often told by men in public offices when I ask them why they do not obtain the services of soldiers for vacancies, that they would have been very glad to have taken them, but there was no soldier who came forward. Until an Order in Council has been passed absolutely forbidding any man in a public position to give

away a position of trust, or of any position whatever that is paid by the State, to any man till he has applied to some central office and asked that central office, "Can you supply for the vacant position a discharged soldier or a man belonging to the Army Reserve?"—until that has been done I do not believe we shall ever arrive at what we have all set our hearts upon. As regards recruiting, I have already expressed the opinion I entertain upon the great improvement which has been brought about in the character of the recruits we now receive, but I am well aware that there are a certain number of Commanding Officers in the Army, and still more especially those Commanding Officers who, as General Biddulph has referred to, are in India, and have had very little experience in recruiting, and only see the soldier after he is a manufactured article, that really expect we shall send them not only good men but giants. The amount of giants in this country is limited; they are not very often the very best soldiers, but at any rate they are very difficult to obtain. I remember not many years ago a friend of mine asking a recruiting sergeant how it was he did not get a sufficient number of men of sufficient size for the regiment recruiting at that spot. The sergeant's answer was, "God Almighty does not make the sort of men you want." There was much truth in that reply. You can get a certain number of tall men with great chest development, but if you insist upon having an army of giants, such as Frederick the Great had, and as we are popularly supposed to have had at some mythical period of our military history—men like our Life Guards and Foot Guards—you will end by having no British Army at all. The men of the size and shape you want do not exist in this country in sufficient numbers. I am glad, however, to say, that owing to the physical standard we have fixed for our recruits, we have got a very satisfactory and effective body of soldiers. There has been a good deal said in condemnation of the unfortunate town recruit. Well, I can only say, that in the regiment I belonged to we invariably preferred London men. We always enlisted in London whenever we could. It was a regiment of light infantry, and when we wanted smart men we always preferred London recruits. We were nominally a Scotch regiment, and for the sake of appearance we used to enlist about one-fourth of the men in the country parts of Scotland. We generally found the rustic from the fields a stupid fellow when compared with the town-bred lad. When it was a question of intelligent work to be done, the sharp little Londoner was superior to the country bumpkins whom we received from the plough.

General Sir BEAUCHAMP WALKER, K.C.B.: I entirely agree as to the cavalry. We infinitely prefer town recruits to country recruits; they can be drilled much more quickly.

Major-General DUNNE: The Rifle Brigade are entirely London men.

Lord WOLSELEY: I am glad to hear so many corroborations of my views on this point. It merely remains for me now to convey your thanks to the lecturer for the very admirable and interesting lecture he has given us.



Friday, June 14, 1889.

GENERAL SIR C. P. BEAUCHAMP WALKER, K.C.B., Vice-President, in the Chair.

FORAGE FOR MILITARY PURPOSES.

LECTURE II.

By GEORGE FLEMING, C.B., LL.D., F.R.C.V.S., Principal Veterinary Surgeon of the Army.

In the last lecture which I had the honour and the privilege of delivering before you on "Forage for Military Purposes," I dealt more especially with the different kinds of forage in use in the various armies abroad, the concentrated foods which have been proposed or used from time to time, and the forage which, after all, has been found best adapted for active service, *i.e.*, that which has been compressed. I dwelt strongly on the necessity for the forage used in the field being that to which the horses have been accustomed, and pointed out the inconvenience, oftentimes danger, in suddenly changing from one kind to another, particularly when horses are undergoing severe exertion, and are exposed to the weather. I showed that concentrated, or specially prepared, and what might be termed "artificial food," was not suitable for horses during war, and that quantity as well as quality was necessary in order to meet physiological demands. Much experimental investigation, no less than every day's practical experience, has demonstrated that concentrations and essences, though useful in the hospital stables, are of little value in sustaining the energies of healthy, hard-working horses; and that bulk is an important factor in allaying the pangs of hunger, and producing that contentment and satisfaction which leads to good digestion, and restoration to the system of that which has been expended in exertion.

The natural food of the horse, in Western countries at least, and which is oats and hay, appears to be sufficiently concentrated; and as it forms the staple aliment all the year round, it is that which should, whenever possible, be allowed on active service. The only preparation it needs—always premising, of course, that the quality is good—is that which best adapts it for conveyance, keeping, and ready issue, without waste either in transport or during consumption. And I ventured to insist upon this preparation being limited to crushing the grain, so as to render it easier of mastication (a great benefit to a

tired horse), and more readily and completely digested (a *desideratum* when the organism is fatigued, and assimilation is consequently weakened); while its being firmly compressed into cakes of a certain weight renders its transport an easy and economical matter, its preservation for long periods, even when exposed to the weather, certain, and its distribution very simple.

The same was said with regard to the hay, which, next to the grain, is so necessary as an article of food. In the field, long hay, even when compressed into compact trusses, is troublesome, and not economical. It is easily damaged by the weather, there is much waste in distribution, and still more in feeding it to the horses when they are on picket lines, and especially when the weather is wet or windy; as then it is either trodden into the mud or blown away. In order to economize space in transport, render it capable of being kept for an indefinite period, readily issued, and easily consumed by the horses without waste, I remarked that it might be "chopped" or cut into short pieces, firmly compressed into cakes of a given weight, and—as with the grain cakes—a certain number of these packed into bales. The grain and hay could be given to the horses, mixed, in a convenient-sized nosebag, and thus all waste would be avoided; while mastication being made so much easier and quicker, the horses would have more time for rest.

Other advantages attending the provision of this kind of portable forage I alluded to, and among them I included that of a smaller quantity of this food being equivalent to the ration of ordinary forage, *i.e.*, uncrushed grain eaten out of the present pattern of nosebag, and long hay eaten off the ground. The diminution might be fixed at a pound, or at least half a pound, per ration. But this matter of ration leads to the consideration of the lecture of to-day, which is intended to deal with the allowance of forage necessary to maintain troop horses in a fit state of health and vigour, so as to meet the requirements of service, either in garrison or the field. On active service, more especially, is this an important matter, as it is absolutely necessary that horses should be kept in the highest state of efficiency, and ready for the severest and most prolonged trials, or the most sudden emergencies; while, at the same time, there may be grave difficulties to be contended with in procuring an adequate supply of forage for this purpose.

The question as to what amount of forage should constitute a suitable ration for military horses is not so easily dealt with as might be imagined, for in discussing it several circumstances have to be taken into account—such as the size of the horses; the season of the year and the climate; the work the horses have to undergo; whether they are protected from, or exposed to the weather; whether they are accustomed to privations, or have been regularly and well fed, &c.

Of course, a certain amount of food must be allowed horses to maintain them in health, even when they do not perform any work; but beyond this allowance there must be an increase in proportion to the energy expended in exertion, though this can only be up to a certain point; for if this expenditure becomes greater than the

system can sustain, then an unlimited quantity of food, even though it be of the most nutritious kind, will not enable them to withstand the strain upon the vital functions.

It might, therefore, be laid down as an axiom, and, indeed, it is generally so recognized, that the quantity of food beyond a certain allowance for what has been well termed "internal" work, and which should be proportionate to the size of the animals, should be sufficient to meet the demands of "external" work and the special circumstances in which troop horses may be placed. In our army, there is a uniformity in this matter which reduces the question of feeding to the greatest simplicity, though it must be confessed that it is scarcely in harmony with reason or experience. The forage ration is never varied all the year round, no matter how young or how old the animals are, how heavy or how light the work may be (with one or two exceptions to be presently mentioned); and large horses weighing 1,200 or 1,400 lbs. receive the same quantity as those weighing 800 lbs. This ration is, as you are aware:—

If in quarters, oats 10 lbs., hay 12 lbs., straw 8 lbs.

If in encampments, oats 12 lbs., hay 12 lbs.

If employed on draught work, 2 lbs. oats extra.

The extra issue is allowed to horses of the Army Service Corps drawing wagons at a trot; and during the winter months only, for all other draught horses when employed on continuous draught work for a period of at least five hours a day.

An extra issue of 2 lbs. of oats, in addition to the ordinary ration in quarters or in encampments, is allowed to draught horses of the Army Service Corps when these are 16 hands high and upwards.

In Continental Armies, the allowance of forage is systematically adjusted to the size of all the horses and the nature of their work.

In the German Army, for instance, there are four scales of forage rations, the difference between them consisting chiefly in the amount of oats. There is, first, the heavy ration, which consists of 11 lbs. $7\frac{3}{4}$ ozs. of oats; second, the ration for Light Cavalry of the Guard, which is 10 lbs. 15 ozs.; third, the medium ration, which is 10 lbs. $11\frac{1}{2}$ ozs.; and fourth, the light ration, which is only 9 lbs. $13\frac{1}{2}$ ozs. The allowance of hay is 5 lbs. $7\frac{1}{2}$ oz, and of straw 7 lbs. $10\frac{1}{2}$ ozs.

These rations are issued as follows:—

The heavy ration is allowed to horses of General Officers, the General Staff, Adjutants, Officers of the War Ministry, Cuirassier and Guard Lancer Regiments, Military Riding School, Guard Horse Artillery and Field Officers of Guard Field Artillery, all Artillery draught horses, those of the Gendarmerie and Intendance, and Transport draught horses. Troop horses of the Gardes du Corps Regiment receive at all times 1 lb. $1\frac{1}{2}$ ozs. of oats, and 3 lbs. $4\frac{1}{2}$ ozs. of hay extra.

The second scale is given to the Light Cavalry of the Guard, Guard Dragoons, and Guard Hussars.

The medium ration is for the lancer regiments of the line.

The light ration is for all other troops and the horses of Officers not specified.

The above are termed the "Garrison Rations," and are only drawn for horses on the strength; the three or four extra horses in each squadron, battery, and company of Transport have to be fed on what can be saved from the forage of the others. It is not compulsory to give the horses their full rations daily, but a portion may be reserved for times when work is heavier than usual.

On the line of march the ration is increased as follows:—

Heavy ration to 13 lbs. $3\frac{3}{5}$ ozs. oats.

Light Guard Cavalry ration to 11 lbs. $7\frac{1}{4}$ ozs. oats.

Medium ration to 11 lbs. $4\frac{1}{4}$ ozs. oats.

Light ration to 10 lbs. $6\frac{1}{4}$ ozs. oats.

The heavy ration of oats is accompanied by 3 lbs. $4\frac{9}{10}$ ozs. each of hay and straw for feeding; the other rations having 3 lbs. 4 ozs. of hay, and 3 lbs. $13\frac{1}{4}$ ozs. of straw for the same purposes, as litter is provided in the billets.

In the field this ration is increased all round by $8\frac{3}{4}$ ozs. of oats, each horse then carrying what is called "the iron ration of oats"—nearly 14 lbs. the heavy ration, over 12 lbs. the second, 11 lbs. 13 ozs. the third, and 11 lbs. 1 oz. the light ration.

During railway transport, each horse is allowed 3 lbs. $4\frac{1}{2}$ ozs. of hay, and 2 lbs. 3 ozs. of straw to lay on the floor and ramp of the wagon. If the journey lasts longer than eight hours, 6 lbs. 9 ozs. of hay is allowed extra for every twenty-four hours.

During Army Corps manœuvres and Cavalry Division exercises for a period of four weeks, the following rations are allowed:—

For Cuirassiers or Horse Artillery draught horses, 12 lbs. $14\frac{1}{2}$ ozs. oats.

For other line cavalry regiments and horse artillery riding horses, 11 lbs. $7\frac{3}{4}$ ozs. oats.

As on the march, 3 lbs. 4 ozs. of hay and 3 lbs. $13\frac{1}{4}$ ozs. of straw are allowed.

Three-year-old remounts at the Remount Depôts receive:—

Oats, 6 lbs. 9 ozs.

Hay, 10 lbs. 15 ozs.

Straw, 13 lbs. 2 ozs.

For three or four months of the year they are put on green food, but the transition to and from this is gradual.

In the French Army there is a similar gradation in the scale of forage ration, according to the arm of the Service and the kind of work performed. The light cavalry (infantry Officers' horses are included in this category) allowance per horse per diem is—oats about $8\frac{3}{4}$ lbs., hay $8\frac{3}{4}$ lbs., straw $5\frac{3}{4}$ lbs. in garrison; on the march it is 10 lbs. oats, with the same quantity of hay and straw as in garrison; at manœuvres, if the horses are in barracks they receive the same ration of oats as in garrison, with $6\frac{3}{4}$ lbs. hay and about 9 lbs. straw, but if in bivouac then the ration is the same as for the march; while

on a war footing it is $10\frac{3}{4}$ lbs. oats, $6\frac{3}{4}$ lbs. hay, and $4\frac{3}{4}$ lbs. straw. The line cavalry (the horses of engineer and infantry Officers are on this scale) receive in garrison 10 lbs. oats, $6\frac{3}{4}$ lbs. of hay, and 9 lbs. straw; on the march $11\frac{3}{4}$ lbs. oats, and 11 lbs. hay and straw; at manoeuvres, if in barracks the ration is the same as in garrison, if in bivouac it is as on the line of march; while on a war footing it is nearly 11 lbs. oats, 9 lbs. hay, and $4\frac{1}{2}$ lbs. straw. The reserve cavalry includes the horses of the Staff, Intendance, Staff of Artillery, and of Engineers, and Auxiliary Transport. The ration in garrison is—oats $11\frac{1}{4}$ lbs., hay 9 lbs., straw 9 lbs.; on the march it is—oats 12 lbs., hay and straw 11 lbs.; on manoeuvres, if in barracks it is the same as in garrison, and if in bivouac the same as on the march; on a war footing the allowance of oats is 13 lbs., hay 9 lbs., straw $4\frac{1}{4}$ lbs. For artillery horses—draught and saddle—the garrison ration is $10\frac{3}{4}$ lbs. oats, hay 9 lbs., straw 9 lbs.; on the march it is 12 lbs. oats, 11 lbs. hay, and the same of straw; on manoeuvres, if in barracks it is the same as in garrison, if in bivouac, the marching allowance is given; the war ration is nearly 13 lbs. oats, 9 lbs. hay, $4\frac{1}{2}$ lbs. straw.

In the Russian Army the daily ration during peace is as follows:—

Guard Cavalry and Artillery, 12 lbs. $7\frac{3}{10}$ ozs. oats, 9 lbs. 1 oz. hay, 3 lbs. 10 ozs. straw.

Line cavalry, artillery, and engineers, 9 lbs. $5\frac{1}{2}$ ozs. oats, and the same hay and straw as above.

Transport draught horses, 7 lbs. $12\frac{11}{20}$ ozs. oats, 18 lbs. 2 ozs. hay.¹

In the regiments and batteries of the Guard, this allowance is given all the year round, but in other corps it is only issued for eleven months, the horses being turned out to grass, and receive no more than 13 lbs. $9\frac{1}{2}$ ozs. of hay for one month after the manoeuvres.

If necessary, barley may be substituted for oats, weight for weight, and hay can replace oats in the proportion of 4 lbs. $8\frac{1}{2}$ ozs. of hay for 3 lbs. $1\frac{1}{2}$ ozs. oats. In war, the above rations are issued, with the addition of 3 lbs. 10 ozs. of oats; and in lieu of straw 4 lbs. $8\frac{1}{2}$ ozs. of hay are given. Thus, the forage ration of a line cavalry regiment during war is 12 lbs. $15\frac{1}{2}$ ozs. of oats, and 13 lbs. $9\frac{1}{2}$ ozs. of hay.

From this statement, you will see that in the great armies of the Continent, close attention has been paid to the quantity of forage required in each arm of the Service, to ensure physical fitness in peace and in war; and you will also gather that in our Army this subject has evidently not received the notice it deserves. Our horses are either underfed while they are performing hard work, or they are overfed when this is light; and if the ration is sufficient for large horses, it must be more than sufficient for small ones. I am certainly of opinion that the whole subject of forage for our troop horses needs investigation; and in view of the fact that the allowance is not

¹ Since this lecture was delivered, Major J. Wolfe Murray, Intelligence Branch, War Office, has had the goodness to inform me that the ration of forage for the Train horses of the Russian Army has been considerably modified, as he had already pointed out in this Journal for 1886, p. 1033. Instead of the daily ration being as above, it is now $13\frac{1}{2}$ lbs. oats and $13\frac{1}{2}$ lbs. hay—a greatly improved ration certainly.—F. G.

properly apportioned between light and heavy horses, or with reference to the work done, and that it is generally inferior to that of other European armies, especially that of Germany, I think the time has arrived when this inquiry should be made. In this inquiry the quality of the forage should not be overlooked; the present contract weight of oats is too low, and should be altered. No oats for army horses should be less than 40 lbs. per bushel.

We must recognize the fact that to feed horses well may be expensive, but to feed them badly, even in peace-time, is much more so; while to nourish them insufficiently during war may mean heavy loss or disaster.

It is not always easy to combine economy, or rather cheapness, with efficiency of a permanent kind. With armies which must always be prepared for war at short notice, and must be rapidly mobilized, the mounted corps should require little, if any preparation, so far as their horses are concerned; for unless they are kept always in a fit state for the field by good feeding and training, there may not be time to prepare them—and some time is needed to do this—when the urgent moment arrives. This necessity must be recognized as applying more especially to the cavalry, as it has to encounter the first strain in warfare; and the army which has its horses in the fittest state will, probably, be that which will gain successes at first, and early victories often decide campaigns.

I would not have it inferred that horses should be rationed to the same extent when performing light work—as is often the case at out-quarters in winter—as during the summer manoeuvres; they should be fed to a degree equal to the labour exacted from them. If a horse is not fed in proportion to the work imposed upon him, compensation has to be made from his muscles; so that he partially consumes them, and consequently loses weight. If a sufficiency of food is not supplied in time, with this loss of weight there is diminution of energy as the muscular tissue disappears, and at last exhaustion ensues.

On the contrary, if the allowance of food is greater than is required, some of it will not be consumed, and a portion will be expended in laying on useless fat—while the state of plethora so engendered will be accompanied by a tendency to disease, and an excitability and restlessness which will lead to a large increase in the list of casualties.

The weight of horses is, to some extent, a *criterion* by which a conclusion may be arrived at as to whether they are sufficiently fed. Loss of weight accompanies an insufficient supply of food, and this loss is all the more marked and rapid as the deficiency is great and prolonged; it is all the greater if the food at the same time be of inferior quality.

We are all familiar with the change wrought in the appearance of horses which have undergone the fatigues of a severe drill season, without any increase in their forage ration; and if their weight were to be compared with that which it was before the season commenced, there would be found a considerable diminution. I do not know if this has ever been accurately tested in our Army, but it appears that

it has been ascertained on, at least, one occasion in one of the Continental armies—that of Austria. In a military journal of that country (*Oesterreich-Ungarische Wehr-Zeitung*), published in October, 1887, there is a report upon the condition of artillery horses belonging to a Division, during the annual manœuvres. The artillery Commandant had the horses weighed before they marched on August 20th, and again on their return to quarters on September 7th—a period of eighteen days. Before marching, the average weight of the horses was :—

In the first battery	974 lbs.
In the second battery	967 lbs.

On their return, the average weight was :—

In the first battery	945 lbs.
In the second battery	943 lbs.

The average loss of weight was therefore 29 lbs. and 24 lbs. The work performed during the eighteen days was on an average from 18 to 22 miles *per diem*.

But we must not forget that the weight test is not altogether a reliable one, unless we take into our consideration, at the same time, the condition of the horses—that is, their energy and endurance. Horses idle and fat, and therefore not well-fitted for hard work, will weigh heavier than the same horses in good hard condition, and capable of undergoing severe toil. A race-horse, in training, loses weight, but gains in vigour.

I do not consider our cavalry horses, in peace-time, badly fed, nor yet overfed; though it would be an advantage if the ration could be so amended as to allow of more grain being given during the hard work period, and less during the easy work period. For the heavy horses of artillery, Royal Engineers, and Army Service Corps, the allowance certainly appears insufficient, if size and weight are to be estimated in alimentation. And in these this insufficiency is more noticeable than in cavalry during heavy marches in the drill season. It should be the aim of those who have to arrange for the feeding of horses, and more especially during active service, that the ration should be such as to maintain undiminished weight, and increased energy, if possible, under all circumstances. No economy can be more pernicious than underfeeding either soldiers or horses on a campaign. The better they are fed, the better they will perform.

As I have already stated, a certain amount of good food is necessary to keep horses in health and condition, and if work is heavier than usual, or they are exposed to bad weather, or have to undergo severe hardships, then additional forage should be given, and in proportion to the increase in waste of the body through these exactions.

Horses for war should always be in a fit condition for the field, and therefore there ought not to be much variation in the forage ration during peace, except an increase to a small extent when the drills are heavy, and a decrease when the work is light. What the peace ration should be is shown in that laid down for each of the principal European armies. For our own Army, I have pointed out that size,

work, and season are scarcely taken into consideration in fixing the ration. I think it would be advantageous to modify it to meet the requirements of these. If 10 lbs. of oats and 12 lbs. of hay are only sufficient for horses when in barracks at out-quarters, surely this allowance is insufficient when on the line of march or during the drill season!

Compared with the horses of civilians, it cannot be said that, when undergoing a like amount of work, army horses receive too much food. For the largest-sized draught horses which perform steady hard work for a number of hours during five or six days in the week, the daily allowance of food for each horse is about 18 lbs. hay and a small proportion of straw, cut into chaff, with 18 lbs. of oats, and a pound or two of peas or beans. The usual weight of dry food absolutely consumed by an average-sized, well-conditioned cart-horse moderately worked, regularly fed, well stabled, is from 29 lbs. to 34 lbs. daily, of which the hay and straw should constitute about two-fifths; and it is generally recognized that, no matter how nutritious it may be, less than 29 lbs. will not suffice to maintain the body in a fit state for work. In a stud of cart-horses in Liverpool, the following was the daily allowance:—Maize, 10 lbs.; Egyptian beans or Canadian peas, 5 lbs.; oats, 2 lbs.; oatmeal and linseed, 1-3 lbs.; bran, 2-1 lbs.; hay, 10-6 lbs.; roots and grass, 3 lbs. The maize, and beans or peas, with the bran and chopped hay, formed the basis of the usual food allowance. The oats and linseed were only used for sick or delicate-feeding horses. The oatmeal was made into gruel, of which each horse was allowed a drink on returning to his stable when the day's work was done. The roots and grass were given during the months it was considered advisable to use them. In autumn and winter the grain was crushed and given uncooked, except a night feed of steamed food two or three times a week. In spring and summer the grain was steamed, but an occasional meal of dry food was allowed as a change. A further change, both in the quantity and proportion of the grain given, was also frequently made, as conditions of weather or work appeared to require, but the autumn allowance was always considered the most invigorating. The bulk of the hay was given in the form of chop or chaff with the grain, 2 or 3 lbs. of long hay being reserved for night consumption. The best clover hay was always used; and a small quantity of straw was sometimes chopped with the hay. The horses were of average size, moderately worked for six days, and one-fourth of their number for about three hours on the seventh day; their condition was good.

A company employing a large number of horses which draw heavily laden carriages, allows the following ration for each horse per diem:—Hay, 16 lbs.; oats, 10 lbs.; beans, 5 lbs.; maize, 4 lbs.; bran, 2 lbs.; total, 37 lbs. of food for every day. The hay is all chopped, and the grain crushed separately, then both are mixed before being given to the horses.

Every Saturday night each horse is allowed a mash of linseed, mixed with a small proportion of bran, boiled altogether, and given warm. When the work is less, then less grain is given. This, I

believe, is about the usual quantity of food allowed for the larger, slow-paced, and steadily worked horses of civilians. For those of smaller size, but performing work at a faster pace—such as omnibus or tram-car horses—a smaller allowance of food is generally given. The following was the daily ration of the principal tramway companies in the United Kingdom not long ago. It may be observed, however, that this allowance varies in the proportions, according to the price of forage in the market, and also sometimes according to the season:—

<i>North Metropolitan.</i>		<i>Birmingham.</i>	
	lbs.		lbs.
Maize	13	Maize	6
Oats	3	Oats	10
Beans	1	Beans	4
Peas	1	Chaff.....	12
Hay, chopped	7		
Straw ,,,	3	Total.....	32
	—		
Total.....	28		
<i>London.</i>		<i>Liverpool.</i>	
	lbs.		lbs.
Maize	7	Maize	12
Oats	3	Beans	4
Peas	3	Chopped hay	14
Hay, chopped	12	Bran.....	1
Straw ,,,	1		
	—	Total.....	31
Total.....	26		
<i>London Street.</i>		<i>Manchester.</i>	
	lbs.		lbs.
Maize	12	Beans }	
Oats	3	Oats }	15
Beans	1	Maize }	15
Bran.....	1	Hay	—
Hay	11		
	—	Total.....	30
Total.....	28		
<i>South London.</i>		<i>Glasgow.</i>	
	lbs.		lbs.
Maize	7	Oats	6
Oats	7	Maize	11
Beans	1	Hay.....	8½
Hay, chopped	11	Straw.....	1
Straw ,,,	3	Bran	0½
	—		
Total.....	29	Total.....	27

<i>Edinburgh.</i>	lbs.	<i>Dublin.</i>	lbs.
Oats	8	Maize	14
Maize	4	Oats	3
Beans	4	Hay	12
Hay	14	Bran	0 $\frac{1}{2}$
Marshlam	2		
Total	32	Total	29 $\frac{1}{2}$

The work of these horses is performed at a trot of about 7 or 8 miles an hour, with very frequent stopping and starting, and the average distance travelled is probably about 13 or 14 miles a day. Omnibus horses receive a similar ration, but the work is not so heavy.

In the pre-railway days, the horses which drew the mail and stage coaches were most liberally fed, and this liberality was well rewarded by the manner in which their work was done and the appearance they presented. "Nimrod" (Mr. Apperley), in his work on "The Chase, the Turf, and the Road" (published in 1837), alluding to these horses, says: "No horse lives so high as a coach-horse. In the language of the stable, his stomach is the measure of his corn; he is fed *ad libitum*. The effect of this is visible in two ways: first, it is surprising to see how soon horses gather flesh in this severe work, for there is none, so far as muscular exertion goes, more severe while it lasts; and, secondly, proprietors find that good flesh is no obstacle to their speed, but, on the contrary, operates to their advantage."

It is scarcely possible to compare draught Army horses with those employed in this way in civil life, with respect to the amount of work they have to undergo, and especially when the former are in the field. The demands of active service are generally of the most exacting and harassing kind. Much of the traction may have to be done where there are no roads, and often in heavy ground; while with some corps—as the horse artillery, and even the field artillery—the pace may require to be fast, and over very difficult country. At the same time, the horses generally have to remain without shelter and exposed to the weather, and receive but little attention, so far as grooming is concerned. Civilians' horses labour under none of these disadvantages in performing their service. They work on well-made roads, have a definite amount of regular toil every day, are comfortably housed, cleaned, and regularly watered and fed by men who are themselves comfortable and exempt from danger, hunger, and exposure.

Army horses, therefore, employed in draught should be at least as well fed as those of civilians, more especially when the former are on active service. The grain ration should be high, as liberal, in fact, as that of the coach horses mentioned by "Nimrod." 16 or 18 lbs. a-day per horse would not be too much, particularly in long and rapid marches, and even more should be given if the weather is at the same time unfavourable. If the grain is crushed, so much the better; indeed, for tired horses especially, all grain should be so prepared. The

amount of hay in the field is a secondary consideration ; as the grain is increased in quantity, the allowance of hay should be diminished.

With regard to cavalry horses the same remarks apply. The work of such horses is, in many respects, like that of hunters, though it is performed in very different circumstances, and under disadvantages such as hunters never experience. Carrying far heavier loads at all paces, cavalry horses may be required to exercise their energies for days together in bad as in good weather, and without being comfortably stabled or cared for after the day's toil is over : the food being often scanty, and of bad quality at the same time. The hunters, on the contrary, rarely have more than two days a week in the field, and they are seldom overweighted then. They are not troubled with dead hamper on their backs in the form of kit and equipment, as troop horses are, nor, like them, have they to carry from 18 to 20 stone, unless specially selected by their size and strength to move easily with such a load. Troop horses cost 40*l.* a-head to buy ; hunters, to carry the weight they support, would fetch several hundreds of pounds each. The allowance of forage for a hunter of this size is probably not less than 16 lbs. of the best oats daily, to which probably 1 or 2 lbs. of beans and some carrots will be added, while 8 or 10 lbs. of excellent hay supplements the grain. Kept in a warm stable, clothed, bandaged, and groomed in a manner to which the trooper is an utter stranger, and with only two days' work in seven, at the end of the hunting season such horses, nevertheless, often show marked signs of fatigue and wear.

Need we wonder, then, that cavalry horses on a campaign should soon begin to break down, when taxed as hunters never are ? One chief cause for breaking down is insufficient food, and, therefore, though serious obstacles may arise to hinder ample supplies of forage being obtained, everything possible should be done to keep the horses well fed. Cavalry must act with celerity and energy, in order to favourably influence the success of a campaign ; and unless the horses are well attended to in the matter of forage, their action must be weak and slow, and losses among them will be heavy.

These remarks apply more particularly to the horses bred in this country, to which a plentiful supply of good forage is absolutely necessary. Whether it is because they are not inured to hardship, to which they are indeed rarely exposed at home, and seldom miss a meal, much less lose a day's ration, or that they are constitutionally delicate, and suffer to an extraordinary degree when their ordinary allowance of food is diminished, certain it is that, unless they receive particular attention in the matter of aliment on active service, they quickly give in. In this respect they differ much from the horses of other countries, and especially those bred in the East. More powerful and fleet than they when well supplied with pabulum, they offer less resistance to the effects of short rations, and become of little use when receiving an allowance upon which other races can undergo severe fatigue. It is true that our horses are never tested by experience of the hardships of war in their own climate, nor usually in a climate resembling their own ; and this may afford a reason for their

being easily rendered inefficient when sent on active service out of this country, as climate at first affects horses more seriously than it does men. The fact remains, that unless very well fed and cared for, our horses, light and heavy, have a great tendency to become feeble—to lose heart on service; our recent campaigns in South Africa and in Egypt and the Soudan afford ample confirmation of this, while our experience with other races shows that they are not so susceptible.

Take, for instance, the small horses generally designated Arabs. It is wonderful the power of endurance they display when carrying heavy loads for long periods, and receiving at the same time a very scanty allowance of food. One of the most notable instances of this natural hardihood was afforded by the 19th Hussars in the Soudan, in 1884-85, and deserves mention here, as it is not only pertinent to the subject under discussion, but reflects great credit upon that excellent regiment, and especially upon its then chief—the lamented Colonel Barrow—surely one of the most promising and accomplished cavalry Officers our Army has produced.

The regiment was mounted on Syrian horses, whose average height was about 14 hands, and average age 8 to 9 years old, though about 15 per cent. were more than 12 years old. Some 50 per cent. had been through the campaign in the Eastern Soudan with the regiment in the early part of 1884, and returned in a very exhausted condition; and about 10 per cent. had been at Tel-el-Kebir. In June, 1884, they were taken to Assouan from Cairo in barges, and remained there three months. In September they were marched to Wady Halfa, a distance of 210 miles, and there 350 were, in November, handed over to the regiment; all except some 10 per cent. being in fair marching condition. The regiment marched from Wady Halfa to Korti, about 360 miles, the average daily march being about 16 miles, not including halts, which were for four days.

The ration was supposed to be 8 lbs. of grain—barley or dhourra, and 6 lbs. of dhourra stalk; but owing to scarcity, the horses generally received about 6 lbs. of grain and 10 lbs. of stalk. They arrived at Korti in good condition, remaining there for about a fortnight, and receiving about 8 lbs. of green dhourra stalk daily, instead of dry stalk, upon which they improved. At the end of December, 40 horses proceeded to Gakdul, 100 miles, and performed the reconnaissance duties of the column. The march was accomplished in 63 hours; 15 hours' rest was allowed, and then the return march was completed in the same time as the outward one, except that 6 horses did the journey in 46 hours, the last 50 miles occupying $7\frac{1}{2}$ hours. During the 141 hours of the march, the horses were ridden for 83 hours. On January 8th the 155 horses, and 127 men, with 8 Officers, crossed the desert with General Sir Herbert Stewart's column; there being an extra horse for each Officer, and 12 spare horses for the men. The average forage ration for the first 10 days was from 5 to 6 lbs. of grain, with 2 gallons of water; 31 miles were marched daily, not including one day's halt. When the first advance was made to Matamneh, the horses marched to the Nile without having received a drop of water for 55 hours, and only 1 lb. of grain. Some 15 or

20 horses received no water for 70 hours. Between January 20th and February 14th the horses received no grain, but received about 10 lbs. of dhourra stalk daily, or 12 lbs. of green dhourra or green beanstalk. Two days before marching they had 6 lbs. of grain each. They performed outpost and patrol duty, averaging about 8 miles daily, and under these conditions they recovered from the effects of the desert march, though many were in a weak state. For the first 75 miles, the horses had only 4 lbs. of grain and 3 gallons of water; for the remainder of the journey water was plentiful, and 8 lbs. of grain could be spared for each horse. Two marches of more than 40 miles each were made—evidence that the horses were still in a fit state. After two weeks' rest at Korti, the horses marched strong and well to Dongola and other stations, receiving plenty of food and water, and after two months' halt they were in quite as good condition as when they left Wady Halfa. The return march to the latter place—about 250 miles, was performed at the average rate of about 16 miles a day, with one halt for two days.

During this nine months of a hard campaign, in which more than 1,500 miles were marched, only twelve horses perished from disease, though from other casualties fifty-nine were lost. The weight carried by each of these ponies never averaged less than 14 stone, and during the last four months of the campaign the weather was very trying, and the scarcity of water was often severely felt. The management appears to have been excellent; the horses were spared as much as possible from unnecessary fatigue, the men never being allowed to remain in the saddle a moment longer than was needed; marches in column were avoided, extended line being adopted, and when picketed the horses had always plenty of room, and their heads to the breeze. They were allowed to graze, on every possible occasion, on the grass of the Bayuda Desert, though it was too dry to be swallowed.

I think it is pretty certain that English horses would not have survived such an ordeal as this.

In India somewhat similar incidents have been recorded, cavalry horses having successfully undergone long and severe marches on small rations; and Darwin, in his "Voyage of a Naturalist Round the World," mentions the great endurance of South American horses, particularly describing a journey he made, in which his horses had no food for five days.

Whether our horses could be trained to undergo such fatigue and fasting is a question which cannot be answered offhand; but it would be well not to depend upon their displaying much fortitude in the matter of short rations in the field, but rather to make provision for their wants being supplied in no stinted manner. If their powers of endurance are not so developed as in some other races, yet they far excel these in other important respects; like their masters, they possess exceptional qualities which are most conspicuous when food is plentiful, and, knowing this, our aim should be to provide it in sufficient quantity and of good quality—whether the horses are in quarters or the field. To succeed in doing this requires more than

ordinary care and attention on the part of those who are responsible for the efficiency of our mounted troops. Forage rations are as difficult to deal with, perhaps, as are the soldiers' rations—so far as quantity and quality are concerned.

Lieutenant-Colonel COLVILLE: As someone must make a start, with your permission I will make a few observations. The paper which has been read by Dr. Fleming is an extremely interesting one, but it is of a technical character, and, therefore, is probably interesting only to those who take more or less interest in horses. If you take the paper as a whole it consists in this, that horses used in civil life in the country and horses belonging to people not in the Army are fed according to the climate, according to the work they have to do, and according to the season of the year; but that in the Army this rule is not observed, and they are fed all the year round exactly in the same way. Whether the paper is intended to bring that particular feature prominently forward or not I do not know, but I should have thought that any man who was not blinded by innumerable rules of red tape would have acknowledged that that was common sense, and should be observed both in the Army and out of the Army. I should like, as a matter of information, to ask Dr. Fleming whether these Syrian ponies, to which he referred, were entire, or whether there were any mares, and if so, what proportion of mares there were? Dr. Fleming tells us that all horses in the Army, as they necessarily would be the first called upon for active service, should be kept well fed and in high condition, ready to take the field at a moment's notice. That, of course, is perfectly right as to foreign armies, where they have to move by land; but is not there this to consider, that in England before the active operations commence, the horses would probably have to travel some distance by sea, and if they were in too high a condition it would be more injurious to them than if they were in a lower condition, not so well fed, and softer? That is one of the great disadvantages that cavalry now have to undergo in the English Army—they have to travel by sea, and they lose their condition even if they have it, and if their condition is too high they are apt to die. I must confess to being a little disappointed at the lecture. I came in hopes of hearing some proposal from Dr. Fleming as to an improved method of obtaining the forage and of distributing it. I have always thought, and still think, that the system upon which our cavalry horses are fed is not either economical or judicious; that the forage should be purchased by the Army direct, without the intervention of any middleman; that there should be a store in a central position like Aldershot; that all ought to be chopped and mixed, and then should be distributed in bags, say of 90 lbs., sufficient for three horses or more—in the case of cavalry they do not get so much. The horses would then get all that they are supposed to get, and you would be certain that the quality of the hay and oats was really such as was paid for, in which case the taxpayer would benefit to the extent to which the contractors now unduly benefit.

Inspecting Veterinary Surgeon W. B. WALTERS: I should like to say a few words with reference to Dr. Fleming's interesting lecture. I can, perhaps, answer one of the questions asked by Colonel Colville, with reference to the purchasing of forage. For some time past forage has been purchased in Aldershot direct, by Officers of the Commissariat Department, and up to the present the system has answered admirably. With reference to horse feeding generally in the Army, I quite agree with the lecturer that it requires investigation and revision, because I am quite sure that the habit of feeding heavy horses with the same weight of grain and hay as light horses is wrong in principle. The heavy horses are generally the first to suffer in condition on a campaign, and, therefore, require more food in proportion to their bulk than the lighter ones. At the same time I think that if, say, three scales of forage were adopted—I, II, and III—I, for heavy cavalry and draught horses; II, for medium cavalry; III, for light cavalry, infantry, Officers' chargers, and so on—it would be quite sufficient, because I think the German system is very much too complicated. It is excellent in theory, but in practice it would hardly be found to be quite as perfect. Then also as to increasing the ration on the

line of march, mentioned as being adopted in the German Army, I do not quite see why horses should receive an addition to the ordinary scale of ration while actually on the line of march, because the result of this extra feeding—improved condition and increased powers of endurance—should be, I think, present at the time the horses are marching. The effect of giving extra food only during the period of increased exertion would be almost like giving a man a heavy meal just before he has to run a race. It is better to *prepare* horses for the line of march by commencing the extra rations some weeks before they are required to start. As regards the quality and weight of the oats supplied to Army horses, I certainly think that the grain should not weigh less than 40 lbs. the bushel, because in nearly all samples of foreign oats—and the grain purchased for the Army is principally of foreign growth—there is an admixture of seeds which are not only ininutritious, but in many cases deleterious in their nature. I have always been an advocate for crushed oats. It has been observed by many Officers in the Army that the issue of crushed oats on a campaign would be a matter of difficulty if not an impossibility. I think, on the contrary, that there would not be the slightest trouble about it. Crushed oats are considerably more easily digested and assimilated than whole oats, and I am of opinion that 10 lbs. of grain in this form is equal in nutritive value to 11 or 12 lbs. of uncrushed oats. That form of forage known as "grain cake" is most excellent of its kind, and certainly is far easier of transport than the same weight of whole oats. With regard to the loss of condition of horses on service, my experience of campaigning has taught me that cavalry horses are generally the first to fall away, particularly those of heavy cavalry; therefore it is quite necessary that our cavalry horses should be kept up to the highest standard of condition at all times. Of course we know perfectly well that prior to embarking horses for a long sea voyage, it is very necessary to make an alteration in their diet, in fact to prepare them for a period of inactivity; but if animals are embarked in a high state of health and vigour, the loss of condition during the voyage will not be great, and will soon be recovered. With regard to the Egyptian horses mentioned by Dr. Fleming, I had some experience of this class of animal in the Soudan, and thoroughly agree with every word that he has said. They were principally stallions, and these hardy little animals certainly did their work wonderfully well without suffering from privation or climatic influences to anything like the extent experienced by the English horses, although often placed under less favourable conditions.

Colonel F. J. GRAVES, 20th Hussars: Colonel Colvile expressed his regret that the lecturer had not made any proposition. Although there was no direct proposal made, I think it is evident that a useful proposition was made by inference, and I think it is very necessary that the whole question should be investigated with a view to the proper proportioning of forage to the horse's size, work, and to the season; and I am quite in agreement with such a proposal being carried out. It seems to me to be absolutely absurd that a horse at 15.2 carrying a hussar of my own regiment should be fed all the year round upon 10 lbs. of oats and 12 lbs. of hay in the same way as a horse of 16.2, and perhaps 300 lbs. heavier in total mass, carrying possibly from 21 to 22 stone; it seems ridiculous on the face of it. There is a very interesting comparison drawn in the lecture between two batches of artillery, both before and after eighteen days' hard work. In my own regiment at Norwich the other day, an experiment was carried out, not before and after hard work, but positively during a time of what one might call comparative idleness. We had some sixty odd horses, one squadron, put under experiment. I am sorry to say the instructions with reference to carrying out the experiment were so limited that I do not think the result of the experiment or the reports thereon will be helpful in any way, and for this reason: the instructions conveyed to us were simply to report as to the advisability, as I gathered, of a permanent reduction of 2 lbs. in the general ration of oats. This experiment was carried out in the furlough season when we probably had not enough men to groom the horses, let alone exercise them, and when there was very little or no drill done, for the simple reason that we are forbidden to go on the drill-field for fear of cutting it up; and under the further ridiculous condition that every day the horses did happen to go out on outpost duty on the roads, they were to have 2 lbs. of oats extra. The sum total was this: that

just as the horses, after their eighteen days' work in these two batteries of artillery, lost a certain amount of weight, so the whole of the squadrons, with the exception of six horses, lost on an average 35.5 lbs. after two months. They were weighed before the commencement of the experiment, after the first month, and also after the second month had concluded, and the result in the end was an average reduction, as I say, in the whole squadron, with the exception of six horses, of 35.5 lbs. The six horses had gained something under 6 lbs. apiece. What is to be learnt from that experiment? The horses had been doing comparatively little work; they were very fat; our stables at Norwich are dark, and that contributes towards the accumulation of fat, I think. They are also warm, and there is another inducement to fat. The simple lesson I learnt from that experiment was that I considered the horses had got rid of what was positively an incubus to them, and, if I may say so in the presence of the lecturer, what I consider, if they were going on service immediately, would be a danger to them, because horses grossly overloaded with fat are certainly, to my mind, more liable to inflammatory diseases than horses in fairly good working condition. Comparison has been made of the foraging of our Army horses with those of the German, French, and Russian armies, and, looking through the lecture yesterday I gathered that in those countries from which comparisons have been drawn, the nutritive value of the ration, as a whole, is considerably higher than ours. I began to think why it should be so. I think it is for this simple reason, which does not do us, as a sensible people, much credit, that with the exception of Aldershot, the Curragh, Dublin, and one or two other stations, it is impossible for our cavalry to carry out efficient cavalry instruction in the way in which it is possible for the German, French, and Russian armies to carry out their instruction, and for the simple reason that we have not the ground to do it on. Von Schmidt, the great cavalry instructor in Germany, insists on long advances of two or three miles. Where can we get that at Norwich, Brighton, Shorncliffe, Leeds, Manchester, or any other such place? We are put into a reformed turnip-field, and are supposed to do everything it is possible to do with cavalry, confined as we are in such a spot. Therefore it would be absolutely necessary that the nutritive value of rations in Germany and elsewhere should be greater than with us. Although we have a less quantity given, I am quite clear that in times of peace, and especially during the idle season, the winter season, when drill grounds are not available, our horses are over-fed. I am quite clear in my own mind from what I have seen that they are over-fed at that time, and possibly during the manoeuvring season, of which we have had too little in this country, they are under-fed. If they were given the forage during the idle time at a reduced rate I am quite sure the Government would allow us to draw the balance during the hardworking season, and there would be no extra expense to the country. I do not think that there is anything which should prevent that being made a definite proposal. The cake that was referred to in the lecture is simply the horses' natural food under compression. 9 lbs. of that cake and 8 lbs. of hay produced an equal result at Aldershot to 12 lbs. of oats and 12 lbs. of hay, simply because it is crushed. Therefore, I think, if it could possibly be done, that the oats issued, especially at the out-stations, while they might be reduced in quantity, might with great advantage be crushed. We have gone a little way in that direction in my own regiment. We have now four chopping machines in the regiment at Norwich, and I suggested about a month ago that defaulters and the few men now and then in the cells, instead of having shot and pack-drill, should be told off in small parties under the orderly corporals of troops to cut the whole of the necessary chop for the troops in the morning. It is now done, and with very great advantage. One great advantage I would like to notice. The horses eat their food ever so much more slowly; there is no bolting of the food and scattering it about all over the stalls to be trodden down and spoiled; but the horses stick their heads into their mangers and munch away, quietly turning over the chopped hay, picking out the oats, and then finishing up with the chop that remains. It takes a horse one-third or half as long again to eat his food in the stable, with chopped hay under these conditions. I do not see, if we have hay-chopping machines, why we should not do something out of the canteen, or some other fund—the Government I do not suppose will pay for them—in getting some oat-crushers. I am quite sure it would be impossible to get crushed oats from

the contractors in a satisfactory way. There is no article of consumption for the horse which is so adulterated as oats *bought crushed*, but to buy oats in the ordinary way and crush them afterwards is quite feasible. There is another point I should like to touch upon. Dr. Fleming in suggesting by inference the changes indicated and the necessary inquiry—perhaps being in an official position in the matter—fought rather with the gloves, but I think there is one point upon which we ought to hit out pretty hard. There is no article paid for by the taxpayer, I believe, round which circumstances of corruption of the grossest form circle so much as the supplying of our horses with forage; I am quite clear of that. I could keep this meeting very much longer than the ten minutes which I am allowed by giving you the *ipissima verba* of things which have come under my own personal knowledge, which I have run to earth, in the way of corruption in this matter. To take one very simple case, which unfortunately came to my cognizance too late to act upon. At a certain station and at a certain time every single Officer's groom in a regiment was in receipt of a shilling a month from a certain contractor. I should like to know where that shilling a month came from? It came out of the horses, it was saved out of the weight given to them. I know of another occasion where again through being unable to get evidence, we were foiled; in one day a thousand pounds weight of straw was issued short of what should have been issued. With regard to that very cake before you which I invented, I got a letter one day from my manufacturer, telling me that when His Royal Highness had ordered a certain number of horses at Hilsa, which were in very bad condition, to be put on that cake to see how they did on it, about a week after this cake was issued, two quartermaster-sergeants of the troops stationed there came into the office. They said "Good morning" to my manufacturer. He said, "What can I do for you; what is your business?" "Well," they said, "we have come in the ordinary way of business. You have just got the contract for the supply of our horses, and we thought we would just look in and see how things were going on;" and so on. "What do you mean?" he said. "Well," said the spokesman of the two, "it is usual that some sort of commission should be given in order that things may be made to go easy." My manufacturer had very special instructions from me on this point, and he replied, "I do not know whether you know it, but Captain Graves" (I was then Captain) "is the inventor, and we are bound to him under articles of agreement, and anything that is done in connection with this cake we must put before him first." My manufacturer wrote to me giving me the very words that had passed, and I wrote back, taking steps that I flattered myself put a stop to that business there and then. The corruption that goes on with reference to the supply, both as to quality and to quantity, is something surprising, and ought to be made public and investigated in the most thorough way. We know the difficulty of getting evidence on this point; men will give you a vague report, they will say something about so and so, but as to coming to the front and stating it before a court-martial on oath, it is quite another thing, and it is very hard to get such evidence, and I believe the authorities are heartily sick of the job. I have now, Sir, a definite proposal to make which has been on my mind for some considerable time. Shortly it is this. When a subaltern joins a cavalry regiment, he is supposed to have been positively born in a butcher's shop, in a baker's shop, in the middle of a hayfield, and of an oatfield; he is supposed to know good meat, good bread, good potatoes, good oats, good hay, good straw, good everything. He goes on with the ordinary orderly Officer of the day to be taught his duty. After a very little time he is put on duty for himself; he has to go down and to pass the rations, and a lot he knows about them! He goes to the gate, and there you will see a boy of about four or five months' service, very often less,—when we are hard up for Officers for duty,—passing in hay, and if you were to ask him the name of one single grass, as I did one fellow of my regiment, handing him a small tuft of Italian rye grass, he does not know it a bit. They have to pass this stuff in, and they know no more about it than the woman in the moon, if there were such a person. I believe firmly if the thing is to be carried out satisfactorily in the way of supply as to quality and quantity, the proper men attached to the cavalry and artillery and mounted corps who should pass these articles, are the Officers of the Veterinary Department themselves. There are a good many members of the Veterinary Department here,

and I hope they won't think I am trying to urge the necessity of increasing their duties, but rather that they will take my proposition as a tribute to their greater knowledge and higher education in this matter. I admit myself that I do not know enough about forage now, and I would bow to the decision of a properly qualified veterinary practitioner in a matter which so urgently requires investigation as this does. I believe arrangements could be made in each regiment, at each station, so that the forage should be presented at a certain time when the veterinary Officers were on the spot without necessarily increasing their duty. After that was done it could be distributed to the stables in the ordinary course, but for young and inexperienced subaltern Officers to have the power of rejecting or passing that which constitutes the mainstay of the horse's vigour, and the mainstay of the horse's usefulness, is to my mind utterly absurd. It is an important subject, and I do hope and sincerely trust that the Government may be led to take some steps to put it on a better footing. I do not think any better service has been done of recent years in this direction than that of the lectures in bringing it forward to-day.

Colonel JOHN FRYER, C.B.: This is a very interesting subject. There are one or two points on which, if you will allow me, I should like to make a remark. I think we are very much indebted to the Principal Veterinary Surgeon for having given us such a very lucid, interesting, and useful paper. He was called to account for not having produced some plan or proposal for service and other matters, but that is exactly what he wants to hear us talk about. I think we are all agreed on one thing, and that is, that we in the British Army have been moving for many years on what I may describe as the rule of thumb with regard to the horse rations. I am of opinion, and I think many others without the least braggadocio will say the same, that we have very little to learn from any Continental Army with regard to the feeding of horses. I had the pleasure of travelling last winter in a great many of the capitals of Europe, and I cannot conceive anything more superior than the horses in London to those that you see in other European capitals. That is not caused by the breeding of the horses only, but by the care with which they are attended to and fed. I cannot help thinking we should do very much better by taking a leaf out of the book of some of our own great carrying companies which the lecturer has very properly brought forward to-day. Our rule of thumb is this, that we give oats, hay, and water. The oats are mostly foreign, and chiefly Russian. You may get 40 lbs. to the bushel, but with this very often a very thick-skinned oat, which will weigh heavy, and I suggest with all humility that it would be far better to have a mixed food for cavalry and artillery horses, such as we see in some of the rations of the great metropolitan companies. I have had practical experience of some of these companies, being rather largely interested in them, and I can safely say that no horse working either in the London General Omnibus Company, or the Road Car Company, doing the work that they do, could possibly live on oats and hay alone. Give him as much oats of the class we feed our troops on as you like, without other grain, and he will fall away in condition. Bulk also is necessary for condition, but I say we require to vary the ration by giving other grain with oats, and I should like to see that done very much. The next point we should inquire into is this. Does our present ration fulfil the requirements of our mounted branches in quality and quantity, or do we get as much out of the present ration as these great companies do out of theirs? My opinion is we do not, and for this reason, that we do not, as they do, chop and crush our food. By chopping you get the very essence of the hay and the essence of the oats; you get, in my opinion, quite 30 per cent. more out of chopped hay and oats than you do by giving it to them whole. There is one little matter which has not yet been mentioned, it is very cheap, and that is water. Water is the very essence of condition, no horse in the world will keep in condition unless you continually water him. "Water frequently" ought to be written up over every troop stable door—water, water, water. That is the one great secret of condition on a line of march or campaign, that the horse should be watered as often as possible. That may be outside the present question, but it is so. The lecturer said that the first action very often decides a campaign, but I think he will also agree with me that that army whose cavalry and transport stay the longest usually wins the campaign. Therefore the stayers are those which we hope to see in our cavalry, and cannot be attained without con-

tinuous care and attention in the feeding of the horse. I repeat, the two things we require are: 1st, that the ration should be varied when practicable; 2nd, that we should chop and crush everything if possible by steam power. I believe these two points to be mainly necessary for the maintenance of condition in our horses.

The CHAIRMAN (Sir Beauchamp Walker): I have little to say excepting that I very much agree with the Principal Veterinary Surgeon in what he has told us to-day. I should like to ask Colonel Graves what 2 lbs. of ration did you take off—2 lbs. off the hay or off the oats?

Colonel GRAVES: Off the oats.

The CHAIRMAN: And still gave the same amount of hay. There is no doubt that horses require a certain amount of forage in bulk, at least our English horses do; but one cannot help observing—knocking about the world as I have done for a great many years—how totally differently the various races of horses require to be fed. In the German Army, to which Dr. Fleming has alluded, with the exception of the very big horses which are allotted to the cuirassier and lancer regiments, nearly the whole of the horses of the old Prussian Army came from East Prussia, where they have breeding establishments of their own, and the only horses bought were the bigger horses, which are bred chiefly in North Germany and Mecklenburg. But there is a very strong infusion of Arab blood in the horses bred in East Prussia, and I had no doubt, during the long time I was in that country, that a great deal of their hardihood and endurance arose from that circumstance, because it reminded me very much of the horses with a more Eastern blood than our own which I had seen in other countries. It was extraordinary in Spain on how little horses did very hard work indeed: barley and chopped straw were the only forage we ever gave the horses there; and I believe in Arabia the horses do an enormous amount of work on a quantum of forage which people in England would hardly believe in—positively mere handfuls. You cannot in the Arabian desert, of course, have anything in the shape of hay; it really is nearly all grain, and a very small amount; I do not know whether Dr. Fleming can tell us.

Dr. FLEMING: 4 or 5 lbs. of barley.

The CHAIRMAN: There is a question I should like to ask Dr. Fleming—it reminded me of olden times—and that is what he thinks of sheaf barley as forage for horses, I believe any grain may be given, I believe even wheat on an emergency may be given to horses, if it is given with the sheaf straw. I had a remarkable experience of what sheaf barley can do while we were lying opposite Varna, preparatory to crossing for the Crimea. My then chief probably knew more about feeding beasts than any man in England. He had for a great many years looked after his own property in Ireland, and I believe had fed very largely himself for the Irish markets. One day he announced that the Commissary-General had informed him that we had no more forage for the cavalry. What on earth was to be done? He said: "It is no use putting the horses on too small an allowance. Horses must have a certain amount of bulk. If you do not give beasts a certain amount of bulk they are sure to go down." He said: "There surely must be something in the country." Now I had had a habit on the days I was not on duty of riding all over the country south of that part of Bulgaria towards the Balkans, and I had seen that the whole country was covered with ripe crops. I told Lord Lucan this. He said, "What have you seen?" I said, "I have seen quantities of barley, and they are just beginning to cut, in fact." I said, "If you will only look outside the tent you will see one field quite close to our camp." He said, "You come down with me to-morrow morning and we will see the Commissary-General." We went. The conversation was rather a curious one, and at last Lord Lucan said, "My Aide-de-Camp tells me that there is plenty of forage in the country, there is plenty of forage that can be bought. Now I know forage given in the sheaf can be used, even if it is barley, which is otherwise a very heating grain." "Oh!" said the Commissary-General, "that gentleman says there is forage in the country, does he?" Lord Lucan, with the sharp temper which he generally showed when he was being opposed, said, "Yes, if I buy the forage will you pay for it?" "Oh yes," said the Commissary-General, "I will pay for it." I bought 4,000 rations of barley before I sat down to dinner that day, and for nearly three weeks I rode all over the country with money in my pocket and bought

barley for our horses, for that portion of the force which had not gone up the country, and as far as my recollection goes—I was not doing regimental duty at the time, therefore I could hardly speak to it as well as some others—the horses did extremely well and thrived on that forage. Whether it would have answered for a continuance is another question, but I was particularly anxious to elicit a remark on the subject from Dr. Fleming. Water, as he says, does not form part of the horse's ration, but I wish he had said something about water, because I look upon it as nearly as important as the food. There has, I believe, a very good custom been introduced in all new stable fittings, and that is of having a receptacle for water which can be kept permanently filled. It was not so in my day, and I am afraid it is not very much the case in our barracks, but I hope as we are building new barracks occasionally that it may be introduced, because I am convinced it is a very great point. I also believe running water to be about the best water we can give a horse. I remember being with my troop a good many years ago during an election in Ireland, and I observed that the horses fell off after the first two days. In consultation with my sergeant-major, as I believe every Captain ought to be as much as he possibly can, he said, "I think if we watered at the river you would find a very considerable improvement." We went down and watered at the river and I took the horses back to Waterford looking very much better than when we left, which I very much attributed to watering them at running water every morning. I am afraid that altogether our stable fittings are much in the old style. Of all bad ways of feeding the hay, that of the high rack is perhaps the most hurtful: there is a great deal of waste and the horse's forelocks and eyes get filled with dust. I think in private stables now-a-days they are nearly all low feeding. I always crushed my own oats. I was a very poor man and very fond of hunting, and had very few horses. I tried to get as much work out of them as I could, and I always crushed the oats from the first day it was brought to my notice. I hope we may elicit from Dr. Fleming some opinion as to how he would modify our ration, because I always felt the reason why we had 12 lbs. of hay was that there was so much waste and it was for the purpose of giving the horse from 8 to 10 lbs. really to eat. I had one very good rule in my troop during the years I commanded one, which was that if I did not go and look in on the afternoon, my subaltern or some non-commissioned officers did and stirred up the stablemen to going round and picking up the hay that was pulled down and put it back again, because there is no doubt that in feeding from high racks there is an enormous waste of hay.

Colonel FRYER: One-third.

The CHAIRMAN: That reduces it to 8 lbs. The rest gets trodden into the litter, and entirely spoilt for consumption. Certainly 10 lbs. of oats is little enough for the big horses we have in our Service, if they are to do hard work. My hunters had 16 lbs. always, beside it being crushed, and beside a handful of beans in each feed. I think we are all very much indebted to Dr. Fleming for having given us these two lectures. I only wish there had been more Officers of my old branch of the Service and of the artillery to listen to them, and to give us the advantage of their experience, and by so doing to elicit replies from Dr. Fleming, which are sure to supplement the information he has given us.

Colonel COLVILLE: In the omnibus companies' stables the horses all have a receptacle in front of them for water, which is always full, and they drink how and when they like.

Dr. FLEMING: Mr. Chairman and gentlemen, I am very pleased indeed with the reception you have given my lecture. The paper itself is rather disjointed; the materials had to be collected from various sources, and some of them were derived from my own experience. Notwithstanding, the subject is a dry one, if you leave out the water, and it is a difficult thing to make it interesting to people who are not very enthusiastic in the matter of horses and horse feeding. I am only sorry we have not had a larger discussion on the subject, because from my peculiar position it is a difficult thing for me to make any proposals, and I was hopeful that the discussion which we might have had to-day would have informed me, to some extent at least, as to how to proceed in the matter of having an investigation into the foraging of our horses. Nevertheless, so far as the thing has gone, I am satisfied. I am extremely satisfied indeed with the remarks which have been made, and I

shall try to reply to the questions put to me to the best of my ability. The first question asked was as to the Syrian horses. The horses were entire. I do not think it makes much difference with regard to endurance: we have proved in India that the opposite conditions are just as good. It has been proved by the experience of cavalry Officers in India that horses which were not entire worked just as well as those which were, and did not fight so much with each other. My experience, in China especially, of a number of Japanese animals we had, was that they were perfect brutes, and, I think, it is the experience pretty well of everyone who has to do with horses, that they are much better when they are not entire, that their fighting and injuries are very few; and not only that, but in reconnoitring, especially at night, entire horses will neigh, and if the enemy is within 2 or 3 miles he is sure to hear them. With regard to horses on shipboard, it is a matter for regret that our country is an insular country, so far as cavalry is concerned; because it is absolutely necessary that cavalry horses should be in first-rate condition. If we have to put horses on shipboard, of course we run the risk of their good condition rather deteriorating on a voyage; nevertheless, I contend that a horse in good condition is in a better state to withstand the voyage than if he were not in good condition. A horse sent on shipboard requires all the resisting power of good muscles and heart to endure bad weather at sea, and the horses which suffer most are those which are not in condition—that is, fat horses which have not had sufficient exercise before being embarked. The cavalry horse should always be in a fit state for a voyage, and the horse in the fittest state for the voyage is in the fittest state for active service. The rations, of course, differ from those which the horse gets on shore: they are adapted for the horse being kept in one position without exercise. With regard to the contract system for forage which now prevails to a large extent in this country, that was discussed in my last lecture. I know the system is a most obnoxious one, and all who have paid attention to it know that there is no part of the contract system in the British Army more exposed to cheating or robbery in every form than that which pertains to foraging, but the problem is how to get rid of it. At out-stations and small detachment stations it would perhaps not be expedient to send Officers to purchase the forage. I think permission ought to be given to the Officers who command regiments and detachments to buy the forage at first hand; but that again would entail special knowledge, and that knowledge every Officer does not possess, though there is no reason why he should not. Every Officer who has to do with horses ought to know good forage from bad, and be able to estimate the value of forage in the market. If the system of contract could be abolished, and Government could buy direct from the producer, I think it would be much cheaper for the country and very much better for the horses. With regard to the reduction of the ordinary ration, this has been tried. I myself made the proposition, seeing the amount of damage our horses often sustain in the stables during the winter season, and especially at out-quarters. In one of the cavalry regiments in which I served, it was our custom to diminish the allowance of oats in winter, and to give what was saved to the horses during the summer drills. Of course that was not always easily done; large barrels had to be provided, and sometimes we got the order to march before the summer drills began. But I was moved more particularly to make the suggestion from the fact that the casualties in winter in stables are very often much greater than in summer, from the fact that the horses are fed in winter as in summer, and not getting the same amount of work in winter, they amuse themselves by breaking each other's legs. It was proposed that during the winter season 2 lbs. of hay should be substituted for 2 lbs. of oats; that, instead of 10 lbs. of oats, 8 lbs. of oats should be given, and instead of 12 lbs. of hay 14 lbs. of hay. The reports as to the result were of the most contradictory kind. One regiment had not been put on this altered ration long, before it was noticed that all the horses were starved-looking and weak, and a very great sensation was caused. At other stations at the end of a certain period the reports were favourable so far as the horses were concerned; they were in good health, and the casualties fewer than usual. From other stations, again, it was reported that the horses had lost condition, and were altogether unfit for the spring drills. So that the reports would tend to prove that it is not safe to reduce the present ration, either in summer or winter. This I do

not agree with. I have already said that the horses should be fed according to their work: beyond a certain amount they should receive forage in proportion to the amount of exertion they undergo. I think if horses are standing in stables, doing little work, they ought to have fewer oats; more hay should be allowed if necessary, but some of the stimulating food should be withheld. Oats should be given in largest quantity during hard work. I think the present ration might be improved, so far as the materials are concerned. To keep horses upon oats and hay all the year round must be unsatisfactory for them. Some variation might well be made, and we have the example of large companies which employ heavy and light draught horses to show that a mixed ration is necessary and beneficial. If these horses were fed all the year round as our troop horses are fed, I do not think they would perform the same amount of work they now do. We all know that a mixed diet is necessary for ourselves, and it must be the same with the horse. I think if the oats were mixed at intervals with beans or maize so as to make a variation, it would be all the better; but, nevertheless, I do hold that horses should be fed in peace-time as you intend to feed them in war-time: therefore, if you gave them a mixed ration in peace-time they should also have it while on active service. With regard to sheaf wheat or barley, there is no doubt when the grain is pretty well ripe and the straw dry it may be used as food; but if the head is green and the stalk contains much sap, so that there is too much moisture, it will damage the horses. Of course wheat or barley given to horses unaccustomed to it is not the same as oats. We have the fact that in South Africa English horses, when they first arrived there from England, were fed upon "oat-hay" and did well, and there is no doubt that the unripe grain given in the straw is much safer than the grain itself. With regard to water, of course that is only part of the horse's ration on shipboard; it is not taken into consideration in connection with forage, either at home or in the field. It is most important, as has been said, that horses should have as much water as they can drink, and they ought to have water always before them whenever possible. If horses are kept from water a long time, they take an inordinate quantity, which is likely to do them harm, and I am extremely sorry that even in our new barracks the water trough, which is now so common in the stables of civilians, is not present as a part of the manger fittings. We have one improvement, however, the rack is on a level with the manger: the overhead racks are abolished; still I should be very glad indeed to see the water trough alongside the rack and manger. The modification of ration which we might hope for should be something on the scale of the German Army. As already stated, horses should be fed according to their size and the amount of work they do. I think there ought to be a peace ration and a war ration. A light cavalry horse weighing 700 lbs. cannot require, and therefore should not receive, the same amount of forage as a horse weighing 1,200 or 1,400 lbs. A horse standing in a stable, well groomed and kept warm, does not need so much food as a horse standing out in the open, exposed to the weather. I think there ought also to be a garrison ration and a manœuvring or field ration; when the work is inordinately severe, let the ration be still more increased. The German scale of rations is, I consider, a good one, and it is well proportioned to the horses and their work. You will see a great divergency between the German and French rations. The French mounted corps for some years have been complaining about the underfeeding of their horses, and some experienced Officers of cavalry in the French Army say that their defeats by the Germans were largely due to the French horses being underfed and the German horses so well fed. This point is noteworthy, because if you compare the two scales of rations you will find a very great difference. I do not think I have anything more to say on the matter. The discussion has been satisfactory, but I am sorry we have not had a larger attendance of experienced Officers, so that we might arrive at some definite conclusion as to really what the forage rations should be.

The CHAIRMAN: It only remains for me to ask you to empower me to give Dr. Fleming a vote of thanks for his excellent lecture.

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and the 30th June, 1889.

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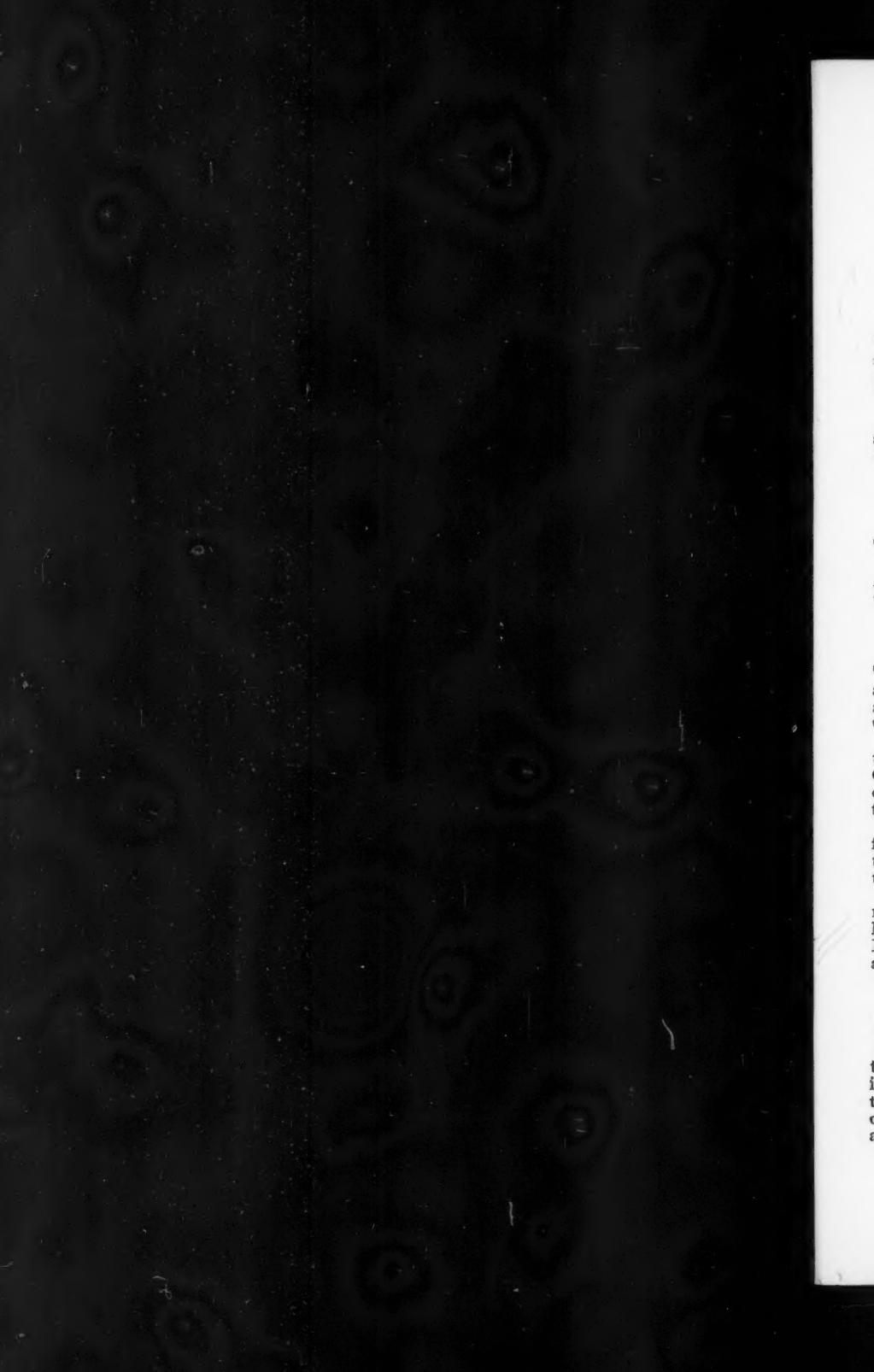
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Shoolbred, W., Major Queen's Westm.
Rifle Vols.
Baker, A. S., Lieut. R.A.
Hichens, T. S., Lieut. R.A.
Blackburn, J. E., Capt. R.E.

Anson, Henry B., Lieut. R.N.
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This portion of the Number is reserved for Articles, either Original or Compiled, on Professional Subjects connected with Foreign Naval and Military matters; also for Notices of Professional Books, either Foreign or English.

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THE FIELD ARTILLERY IN ITS POSITION UNDER THE COMMAND OF GENERALS OF ARMY CORPS DISTRICTS.

By PRINCE KRAFT ZU HOHENLOHE-INGELFINGEN. Translated (by permission) by Lieut.-Col. WALFORD, h.p., R.A.

Introduction.

THE radical changes which the field artillery has undergone, owing to the abolition of the Inspector-General of Field Artillery and to the fact that this arm, like the infantry and cavalry, is now placed under the General Officers Commanding Districts, consist mainly of the following :—

1. In future the Supreme Court of Appeal, with regard to the details of the training of field artillery, will only exceptionally (that is, only when the General commanding happens to have served in the artillery) be presided over by an Officer of the arm ; the same rule will also hold good with reference to inspections.

2. The principles of the tactical employment of field artillery will henceforward be brought to light by the Officer commanding the troops alone, and this during the exercises with the other arms ; the superior Officers of the technical arm will have nothing to do with the matter.

3. Personal questions, such as the career of the Officers of the arm, judgment with regard to their efficiency, matters affecting their honour, &c., will henceforward come before the highest authorities through the Generals of Districts, and such questions will thus be dealt with in the artillery exactly as they are in the infantry and cavalry.

I. The Course of Elementary Tactics.

Many a gunner of the old school will shake his head when he hears that the General of a District, who may have passed his whole service in the infantry or cavalry, is now to be the highest Court of Appeal with regard to the inspection of field artillery, and that his criticism is, within the limits of the corps, to be decisive as to the future course of training of that arm ; and many thoughtful Officers of the other arms will perhaps consider his

doubts to be entirely justified. There will indeed be found not a few Officers of infantry and cavalry who will, in their modesty, believe themselves to be quite incompetent to supervise the training of field artillery in detail or to inspect and criticize their elementary tactics, since they will feel convinced that they know nothing about them.

It certainly cannot be denied that the long-felt and frequently expressed wish of the artillery, to pass entirely, permanently, and, as a matter of organization (even in peace), under the command of Generals of Districts, arose in part, even though those concerned had not the least idea of the fact, from their experience that they have always been praised by these Generals on the rare occasions on which they have up to the present been inspected by them. Never have they been seriously found fault with by any Officer who had been brought up in one of the other arms. For such Officers did not consider themselves authorized, indeed were not so under the former organization, to notice and reprove faults in elementary tactics. This was the duty of the "technical superiors." For if, under the former organization, the General of a District had reprobated any faults in elementary tactics, he would have found himself exposed to the risk of a conflict of authority with the Inspector of Artillery. He had every reason to avoid this as far as possible; since, owing to the nature of the organization of the artillery with its double system of command there were already plenty of opportunities for friction and the conflict of authority. For this reason the General in command seldom felt any desire to concern himself with questions relating to the elementary tactics of the artillery. For, indeed, they are not sufficiently interesting to induce him to study them seriously, while he has, moreover, other things to do than to work at the details of matters which do not form part of his duty. An inspection of artillery by a General in command was formerly little more than a compliment (and a sort of holiday for the men) offered by that Officer to an arm which was only half under his command. When this holiday was over then came the "technical superior," like a sort of devil's advocate, from whom the troops heard nothing but blame, since all possible praise had already been lavished upon them. It is thus not wonderful that these technical superiors were disagreeable to the troops, and that the latter desired to be rid of them altogether, and to be placed directly under the command of the General of the District, who was so delightfully kind. I must at this point expressly warn against any suspicion that I at all suggest by these words that the artillery Officers had any intention to throw dust in the eyes of their non-artillery superiors. These feelings, as I have already said, produced their effect without the knowledge of those concerned. They are too human and too natural not to be altogether pardonable. When I look back on past inspections, I cannot myself claim immunity from the same feelings.

It would certainly be a great evil, if the future inspections of field artillery by the General in command were, as they used to be, regarded merely as an act of politeness, or were to be considered by the men simply as a holiday; for when troops are only praised and never blamed they are sure to fall off.

The question arises, whether this evil will be a consequence of placing the artillery under the command of the General of the District.

This question is identical with another, namely, whether Generals who have not been brought up in the artillery will venture to supervise and inspect the training of field artillery in elementary tactics, and whether they are rendered capable of doing so by their military past.

In order to solve this question, it is necessary to lay down distinctly and exactly how far a General in command ought to concern himself with the details of elementary tactics, and also what are the peculiarities of these details.

As far as the position which a General in command holds to the different arms which are under him, and as far as the time which is at his disposal will permit, it is established that it is his duty to inspect every regiment annually when its training is completed. But, since they have, in addition, to give their opinion regarding the fitness of the field Officers for regimental commands, Generals usually arrange to be present also, as far as possible, at the inspection of battalions by the Divisional Commanders, and they are thus able, at least once in every two years, to see each battalion once exercised in detail. When time will permit, and when they have special reason to pay particular attention to some one or other of their subordinate Officers, they are allowed here and there to be present at the inspection in detail of yet smaller bodies of troops, and we not unfrequently see the head of an army corps at the inspection of a company or a squadron, or even at an inspection of infantry recruits or of riding in the cavalry. But such attention to minute details forms certainly no part of the duty of a General in command. It is only absolutely necessary that he shall inspect a field Officer's command (which in the artillery consists of a complete brigade division of three or four batteries), and shall be in a position to thoroughly criticize their training.

What then are the details with regard to which he has to give an opinion?

First of all the general military appearance, the carriage, the equipment, and the training of the men; and, secondly, the elementary tactics of the troops, which finds its highest expression in service practice.

No one will deny that every General can give a valuable opinion on the former question, whether the troops he inspects be infantry, cavalry, or artillery. The carriage of the men, their dress, correct instruction in the military duties of soldiers, and military matters in general, are in all arms judged by the same standard. It may perhaps be objected, that a General who has served only in the infantry will be an indifferent judge as to whether the fitting of the harness and the arrangements for draught of the artillery have been well carried out. But anyone who has a military eye for things in general will see at the first glance if there are any grave faults in this respect. An Officer of such high rank neither will, nor ought, to trouble himself as to whether every trace is correctly hooked in, or every hame is exactly fitted, or with any such details; any more than, if he has previously served in the infantry, he need pay attention to whether every chin-strap in the squadrons is correctly put on.

With regard to the second point, the *elementary tactics*, everything is already laid down in the Regulations. It is certainly neither desirable, nor is it within the limits of possibility, that the Artillery Regulations should be so entirely a second nature to a General who has never served in that arm as they are to a field Officer who has grown gray among the guns. But, if we look through and consider the details of the several parts of the Artillery Regulations, we shall find that such knowledge is not necessary to a General, if he is a sound and experienced man and has all arms under his command, in order to enable him to be in a position to fully inspect and criticize artillery in their elementary tactics.

The first portion of the Drill Regulations relates to *Foot Drill*. Now everyone will agree that a General in command must be able to give a valuable opinion with regard to this. The trifling differences in foot drill between artillery and the other arms, which arise simply from the fact that some of the men (the drivers and horse artillery) wear spurs, while others do not, are of no importance. It would indeed be a very good thing for the field artillery if they could now and then get a few hints from a sound infantry Officer about their foot drill and about training in marching. The artillery take the gun as their unit, the infantry take the man. The artillery there-

fore attach the greatest importance to the good effect (a consequence of good training) of their gun, while the instruction of the infantry finds its highest expression in the greatest possible perfection of each individual soldier. It thus comes about, that in the field artillery the care of the individual soldier does not always receive so much attention as is its due. This usually becomes evident by the carriage of the men and by their foot drill, for these drills are generally carried out *en bloc*. We are often pleased when the few evolutions which are called for have been carried out according to the Regulations, and entirely fail to realize that a free, unconstrained, and natural march must be developed by individual instruction, or again what an excellent effect such individual instruction and a correct attitude in marching have upon the health, the discipline, and the spirit of the man. I have certainly often been told that the artillery have a host of things to learn, and have no time to expend in so much trouble about marching. But this is quite wrong, for a raw untrained man can be much more easily and quickly taught to acquire a correct, free, and unconstrained action in marching, when the instructor gives him good individual instruction, than when he from the first squeezes his recruits together in rigid order, and puts them through the evolutions as a body. Moreover, since the improvement in small arms and the growth in importance of individual fire in action, the infantry soldier has at least as many things to learn as the gunner.

On this point a General who has come from one of the other arms will be a better critic than a field Officer who has grown gray among the guns.

The next part of the Drill Regulations refers to *Standing Gun Drill*. This is certainly that portion of artillery work which a non-gunner will find the greatest difficulty in criticizing. And yet it is one of the most important items with regard to the effect of the arm, for it will be obvious to every thinking soldier, that a battery of which the guns are badly and carelessly served cannot make many hits. We need only remember that a gun laid incorrectly, or a tangent scale wrongly adjusted, must cause a miss. But a General who has even only once attentively watched artillery at gun drill, will quickly learn to recognize whether the service of the guns is correctly carried out. Owing to the difference of the functions of individuals in the service of a gun, active gunners soon draw attention to an insufficient accuracy of drill by the loud hints which they give each other, or which are tendered by the Officers and non-commissioned officers. No other troops are so absolutely obliged to speak loud as are the artillery. A General who knows this, and who proposes to make standing gun drill the object of his inspection, will content himself with giving a sharp reproof whenever he hears anything beyond loud, ringing, regulation words of command. If he goes a little further, and every now and then looks over a gun before it is fired, and convinces himself that the elevation which was ordered has been given, he will, as far as regards detail, have done all that he can do, whether he be a gunner or no. But he will seldom have time to make a special inspection of standing gun drill. The Inspector-General of Artillery could only do so exceptionally. He used to form his opinion with regard to the gun drill when he inspected the drills with horsed guns, and also at service practice. I shall come to this later on.

Another section of the Regulations refers to *Instruction in Driving*. With regard to this practice, it is also no part of the duty of an Officer of such high rank as a General in command or an Inspector-General to judge whether the corners and turns in taking ground or in wheeling are correctly carried out according to Regulations, by the different pairs of the six horses, or whether the driving when limbering up or coming into action follows exactly the right curve. Attention to this can, and must, be left to Officers of lower rank. It will be sufficient if the rates of march at the different paces be correct

(which may be checked by an Aide-de-Camp with a watch with a second-hand, if distances be taped out and marked on the drill-ground), if the columns move evenly at a rapid pace, without any checks or hurrying and without losing their intervals, and again if there is absolute silence among the troops and nothing is audible beyond words of command and trumpet calls. He will not trouble himself at all with regard to the old, but ever new, questions of the instructor in driving, as to whether, and when, a short wheel or a wide wheel is to be used. He will usually make no special inspection of driving drill, and will not attend the elementary driving in the *manège*. He will, at the most, in cases where young Officers have arranged to form a class for instruction in driving, do them the honour of being present at a part of their drill. With respect to the rest, his time will as a rule be too limited to allow him to judge the driving of the troops except at the drills with horsed guns, while in that the three criterions, which I have before named, viz, pace, evenness, and quiet, will be sufficient to enable him to form and give a well-grounded opinion.

From what has been said above it follows that the General, beyond occasionally seeing a foot parade, need only inspect *Drills with Horsed Guns* in order to go as far into the details of field artillery as is in accordance with his high position. With regard to this particular exercise he will, as a commander of all arms, consider it from the point of view that the artillery must be in a position to carry out whatever he may demand from it in war.

What are the demands which he will make upon it? He will realize that it must be at the right moment in the position where he needs it, and that it must be able to shoot well wherever he employs it. In order to arrive betimes into position, it must be able to get over distances of such length as may be consequent on this duty, and this either in column or in line at a rapid pace (a trot), and in line at a gallop also; in doing this it must not become disordered, nor must the horses be overstrained, while it must advance into its fire position in good order, quietly and with confidence. How great are the distances which field artillery must be by practice accustomed to traverse?

The greatest distance which a mass of artillery has, under ordinary circumstances, to pass over at a rapid drill pace, is that which must be traversed when the corps artillery is ordered to hurry up to the head of the corps for action. We know that the corps artillery marches, as a rule, in rear of the leading Division of the corps. When an engagement develops itself at the head of a corps on the march, and the corps artillery is directed to take part in it at once, the latter will have therefore to move at a rapid pace over a distance equal to the length of a Division in order of march. It must after that form line and advance into its position. The General therefore can, and must, require it to trot in good order in column for a distance of 6,000 paces, and then to gallop 1,000 paces to the front; in other words to trot for twenty and gallop for two minutes. Far greater demands than this may be made upon field artillery in war. It may have to march many miles at a rapid pace. But such forced marches scarcely come under the head of exercises, since during them there will be intervals of walking and of halting, in order to let the horses get their wind. These movements are thus forced marches and not drill movements.

The above advance will in war, at least as far as relates to the trot in column, be ordinarily carried out on high-roads or made roads. The General can therefore inspect it on the open drill-ground, without failing to keep up the likeness of war. With this object he can cause field artillery to trot round the drill-ground for twenty minutes (his Aide-de-Camp checking the pace by the marked distances), and finally he can order them to advance into their fire position by a gallop to the front of two minutes. But I must not

omit to say, with reference to this matter, that the column of route is the formation which will be exclusively used in war. If the General desires, however, to make a slight change, he may direct that the force shall form column of sections for the latter part of the column movement. When the evolutions necessary for all this are carried out by a mass of artillery (a brigade division or a regiment) at the regulation pace (300 paces per minute for the trot and 500 for the gallop), without talking or any irregular suggestions on the part of the Officers and without any checks or hurrying in the column, in such a manner that the line of artillery stands finally ready for action in the selected position,¹ the General will know that this artillery can give him all that he must ask from them ; he need go no farther than this into the details of the exercises with horsed guns. He certainly need not be a professional gunner in order to form a correct judgment in this matter. On the contrary, I am almost inclined to believe that a General who is not a gunner will inspect such masses in a manner more in accordance with the conditions of war than if he were a professional artilleryman. The latter is a little inclined to ride artillery hobbies, to call for complicated drill movements, and to attach inordinate importance to good driving, exact right angles, neat deployments, &c., whereas a General, who is simply a Commander of troops, cannot even in peace desire more than he must demand in war. The latter will, therefore, inspect in a manner more in accordance with service conditions, and his criticism will, as used to be said, "smell more of powder and ball."

We have not long since known cases where the professional gunner, as the war period faded more and more into the past, fell farther and farther away from his true war duties, and thus took to drill problems which could never be used in war, such as the half-column in sections, the line of columns of sections, and other peace manoeuvres, which were borrowed from the cavalry, but are quite valueless for artillery.

After the fire position has been taken up, the General will ride along the line of batteries in action, and will observe whether the service of the guns is carried out smartly in military style ; he will thus, as I have said above, inspect the standing gun drill.

It may happen (and there is no order against it) that a General may wish to make at his inspection a more exact inquiry into the efficiency of individual batteries for war, and also into the value of individual battery commanders. He will find it most easy to do this, if he orders the mass of artillery to be led into a position² to which the whole force must advance by batteries. He will thus have every facility to carefully observe each battery and each battery commander ; if this evolution is carried out well and in good order, the troops are efficient as regards their elementary tactics. This is of all evolutions the one most in accordance with war conditions, since it is very frequently used in war. For when a mass of artillery comes up in column at a trot, and the Commander wishes to open fire at once, the leading battery will in most cases form line, open fire and find its range, the other batteries coming up in succession as they arrive. Moreover in very rare cases will the ground permit an entire brigade division to advance on its full front with the correct intervals.

In the three great battles of Königgrätz, St. Privat, and Sedan I only once saw a brigade division advance in line ; this was in the first position at Königgrätz. In every other of the very numerous cases the advance took place by batteries.

If a General thus inspects the "exercises with horsed guns" of a brigade

¹ Against a marked target, and following a pre-arranged tactical idea.

² Against a marked target, and according to some simple tactical idea.

division which has completed its training; that is to say, if he first inspects it in line, then makes the above-mentioned long movement, then watches the service of the guns, and finally makes it advance again into position by batteries, he will be able within an hour to form a correct judgment as to whether the troops can meet the demands which he must make upon them. A regiment will require an hour and a half. In this estimate I have allowed for two marches past, each in a different formation. The horses must be in very fair condition if the troops are able to carry out such continued movements at a rapid pace. Horses in bad condition, badly fed or with bad legs, will be no more capable of carrying them out than will those which are overfed. The General will thus, when he inspects the first position, be able to judge of the condition of the teams.

It appeared at first almost an anomaly when I said that a General who is not a gunner is in certain respects better fitted to inspect a mass of artillery than a senior Officer who has grown old in the arm. But such phenomena have been not uncommon. Frederick the Great himself was decidedly not a renowned horseman. He used to hit his horse over the ears with his cane. But he knew better than anyone, either before or after him, what he could and must demand from the cavalry. But I own that every General is not a genius, as the great King was. I have, however, known many practical infantry Generals who understood right well how to use cavalry, and what they must demand from them, and who moreover improved cavalry matters by their criticisms. If it be said that I ought to confine myself to artillery questions, I will ask who brought about the enormous improvement of field artillery, by showing the need for rifled guns? Was it not King William I, supported by the Chief of the General War Department, General von Voigts-Rhetz, both of them Infantry Generals? And they did this in spite of the opposition of the then Inspector-General of Artillery.

It is obvious that a General who proposes to inspect artillery must be so far acquainted with the nature of that arm that he knows how and where he would use it in action. But so much we may very well expect from each of our Generals, since they are called upon to handle all arms in war, and must therefore know how and where to do so in peace.

But the *Practice*. Every non-gunner will from the first consider that only a gunner can inspect the practice of artillery. Everyone is accustomed to believe that there is something specially secret in the practice of artillery, and that it can be appreciated and understood by the initiated only; so much so that people often fancy that no layman may dare to lift the veil from before this sacred mystery, and that only one of the "illuminati" is in a position to form a judgment concerning the practice of the arm. A few decades ago, the artillery surrounded their art of shooting with so much scientific mist, that everyone else thought that, in order to form an independent opinion on the practice ground, one ought to be learned in mathematics, physics, and chemistry. But since then, the artillery have burst asunder the fetters of technical science, as His Majesty the Emperor Frederick III very accurately remarked, and have laid down the mask of learning. Moreover, the infantry have with their rifled arms practised the principles of the art of shooting, and were indeed for some time in advance of the artillery. What then is the theoretical difference between infantry and artillery practice? At the most this, that the artillery has the larger shooting machine and the larger shot. On the other hand, artillery practice is the simpler and easier of the two, since the gun stands fast, while the shooting of infantry is complicated by the fact that the rifle is held to the shoulder. It is not necessary to be able to calculate either parabolas or the resistance of the air, in order to know that a high tangent scale gives a more curved

trajectory and a greater range than a low one. And if the artillery now possesses a special kind of practice, that with shrapnel, no one need be afraid to give an opinion concerning it. Any person who has, even only once, stood sufficiently near to the target to be able to see the effect of shrapnel, will quickly obtain a full insight into the nature of this kind of practice. Has not every General and every Divisional Commander, even though he may have passed his life in the cavalry, to form an opinion concerning the practice of the infantry regiments which are under his command? As he is now bound to pass judgment on the more difficult, he will certainly be able to criticize and inspect the simpler form.

The results of the practice of infantry can be even examined and judged in the study from the Practice Report alone. I might almost say that this is possible with artillery practice also. In order to make it so, nothing, in my opinion, beyond one order is required; in the practice regulations of the infantry a rule is laid down that every knowingly false score on the target shall be punished (by court-martial and not merely by the Commanding Officer) as a false report. A similar regulation with regard to the range-party is very desirable at artillery practice; this would make the practice report so trustworthy that all Officers would be able to judge and criticize artillery practice also (at any rate, the elementary practice) by simply reading the practice reports in an office.

An inspection on the spot would be desirable only in the case of the service practice of the artillery (which may be compared with the field firing of the infantry), less, however, for the purpose of seeing how the troops shoot, since that can even in this case be learnt from the reports, than in order to see how they carry on their practice.

In my opinion the General would do best if, on the day of inspection, he remained during a part of the practice in the neighbourhood of the troops, and during the other part in the neighbourhood of the target. While he is near the troops he can observe whether the batteries advance into position in good order and in a soldierlike manner, whether confidence and quiet govern the service of the guns (uncertainty always shows itself plainly by much talking in addition to the words of command), whether the battery commanders keep their fire in hand, whether they order the proper corrections, and how they appear to be skilled in the observation of fire from the battery. When near the target he would know by the first shot whether the range has been at once correctly judged. The continuation of the practice would show him whether the first shots were exactly observed and whether the troops found the correct range, so that the effect of the fire may be eventually consistent with the accuracy of guns of precision. For, if the matériel be good, the effect in hits offers the best standard by which to judge of the excellence of the service of the guns and of the conduct of the fire; it is thus also a criterion of the elementary gun drill. While the artillery still had smooth-bore guns, it was within certain limits a mere chance where they hit. But now that they have rifled guns, good shooting depends upon the service of the guns and the conduct of the battery. No battery can shoot well unless it be well drilled and well worked. A battery which is badly trained and badly managed can hit nothing. The General will thus best judge by results with regard to the elementary tactics of the battery.

If he has any time left on the day of inspection, and can thus be present at the comparison of the practice report with the observations from the battery (which takes place by regulation after every practice, for the information of the Officers), it will be so much the better. For he may thus best learn to know his subordinates, as to how far they are skilled in observation of the effect of fire, and as to what was their personal opinion while the practice was being carried on.

It would be very desirable that many Officers of the other arms, and at least all Generals, should once every year attend a comprehensive practice of artillery (when possible on the day of inspection), since in war every General will probably have artillery, even if only temporarily, under his command, and will in any case have to stand under the fire of hostile artillery. For on the practice ground the strength and the weakness of this arm are plainly visible to the eyes of an observer, without any necessity for wearisome study on his part.

When the position has been taken up, and before the commencement of the fire, it will be observed, if an effort be made to estimate the range, how difficult it is to get a clear view of the target, even at medium ranges. The range of 2,000 metres is certainly one at which in these days the fire of artillery may be annihilating, if it is in the main accurate. But can the enemy be always visible at a distance of more than a mile, even if he be not behind cover? If the light be unfavourable, or the weather foggy, or if a wood of greater height than the target stand behind it, it sometimes happens that an enemy posted in the open altogether escapes notice. In order to give our practice an air of reality, we use on the practice ground some means of imitating the smoke and the noise of the enemy. It not unfrequently happens that these first enable us to catch sight of the target. From this fact every thinking soldier will draw the conclusion that at long and medium ranges the assailant will be often able in war to open fire before the defender, since the latter will not see the former until he commences to fire. And this will take place in war even more often than we should be prepared to expect, judging by our experience at practice; since in a battle which has once got into full swing the attention of the defender's artillery will frequently have been already drawn in another direction.

Again, we can see on the practice ground, and this before the fire opens, how difficult it is to judge such long distances, even approximately; and 2,000 metres is really only a medium range. But great mistakes in the original estimate of the range add enormously to the length of time required for ranging.

As soon as the fire commences we shall notice how difficult is the observation of the shots. The shell is the best range-finder which has up to the present been invented. But how difficult it is, under unfavourable conditions, to observe fire with accuracy, and to be certain whether a shot has been short or over; this will be very evident on the practice ground. Let us suppose, for example, that a few hundred paces in front of the target there is a depression in the ground, in which the first shell bursts, the range having been judged so much too short. The smoke of the burst will not be visible until it has risen and grown thin, when it will look as if it was behind the target. We shall imagine consequently that the shell was over, and shall therefore reduce the elevation. It is within my experience that very well trained gunners have fired away the whole of their ammunition without a single hit, and I have seen in battle a long line of artillery firing for a considerable time from one position, and shooting 500 paces short, until at last I told them of the fact from my own observation. There are in battle even greater difficulties; not only does the enemy's fire confuse us with the smoke and the flashes of his guns, but sometimes also several batteries are firing at the same target, and we are thus left uncertain as to which of the bursts which we observe is that which must govern our corrections. In my experience we have been for half an hour in this state of uncertainty, until at last I gave the order to fire salvos by batteries, which gave us a group of six simultaneous bursts, and could thus be more distinctly observed.

Arrangements are now made at all practice grounds which render it possible to fire also at moving targets. Any one who has, even only once, been

present at such practice will see clearly how seriously the difficulties of observation and correction are increased when the target can change its position. These difficulties are still greater when the target moves not only in the direction of the line of fire, but also across it. Infantry can easily follow with their rifles the crossing movement of a target, but the gun is a fixed firing machine, of which the trajectory can be quickly changed by using the elevating gear, but of which the traversing to either side is much more difficult. A single shot which is wrongly judged when firing at a moving target (for example, if it be thought short when in reality it was over) may lead the Battery Commander into such errors that he may throw away all his ammunition by firing over the target. The nearer the target comes the greater will be the effect of such doubt upon his nerves, and he may thus become very excited, especially if the target moves quickly. But perfect calm and quiet calculation are absolutely necessary if the observation and correction of fire are to be accurately carried on. A Battery Commander who is excited and uncertain will rarely hit anything. I have seen well practised Battery Commanders who, from sheer anxiety to do well, have become so excited on the practice ground, owing to the presence of many and distinguished observers, that they could hit nothing at all. It will be obvious what enormous effect such physical conditions may produce when the target in battle is a charging enemy, who will capture the battery if he is not shot down. The consequence of this is that the most effective projectile of field artillery, a shrapnel which bursts in the air in front of the target, is very seldom of use against a quickly moving target, since the setting of the fuze of a shell which has once been entered into the gun cannot be altered.

A cavalry Officer who watches artillery practice may thus draw conclusions from it, as to how he ought to act when he wishes to capture a battery in action. He will neither walk nor halt for a moment while within sight or reach of the artillery, and will during his movement of attack, if the available space and the character of the ground are suitable, by no means go straight at the battery; he will prefer to incline first to the right and then to the left, in order to oblige the enemy who is laying on him to continually change his line of fire, and thus to make him nervous. It will also be a great advantage to the attacking cavalry if they charge the battery at the same moment from different directions, and thus divide the attention of the artillery and encourage errors.

On the other hand, an observer on the practice ground will see most distinctly that artillery when firing at short ranges at a standing target can and must hit with (I may say) every shot. The range of from 1,000 to 1,200 metres is now a very short one for artillery, while for infantry it is almost the limit of effective fire. It would be an excellent thing if, in the presence of Officers of the other arms, a battery and a company of infantry might annually fire simultaneously at similar targets, in order to show observers that between 1,000 and 1,200 metres artillery has from thirty to fifty times the effect of infantry, while the latter (allowing for an equal expenditure of time and of weight and cost of ammunition) will not succeed until they arrive at 500 metres in equalling the effect of the artillery at 1,200 metres. An infantry Officer will thus learn that if his attack is directed against artillery he will do well to pay no attention to the enemy until he has pressed on without a check to within 500 metres of him. The experience which he will gain on the practice ground, that artillery can at a range of from 1,000 to 1,200 metres exactly measure the distance of the target, will further teach him never to neglect to obtain information from the artillery, as he advances past it against the enemy, with respect to the range at which they are firing, for this will give him a starting point from which he can, by counting his paces as he advances, decide when he has arrived at 500 paces from the target.

For it is notoriously very difficult for the infantry, even at 500 metres, to see whether the small bullets of their rifles fall short or over.

Observers who stand near the targets can see the effect of the projectiles of the artillery. They will notice that this effect extends farther in depth than in width. They will thus acquire the conviction that dense, and above all deep, targets offer the most favourable objects for the fire of artillery, which is consequently most effective against columns. Cavalry and artillery will conclude from this that they must avoid all column formations if at any time they are compelled to show themselves within effective range of the enemy's artillery, and that they may expect to suffer the least possible loss from such fire if they can take up an extended order of battle.

II. *Applied Tactics.*

The fact that field artillery will in their course of applied tactics be directed by Officers commanding troops of all arms is not absolutely dependent upon the new organization, since they used even formerly to be told off at the detachment exercises and field manoeuvres to Generals of Army Corps, Divisional Commanders, and even to Officers commanding brigades. But this was rather a matter of form as regarded the details. Very great importance was attached, even at the manoeuvres, to the judgment of the artillery superior Officers. Differences of opinion and conflicts of authority were thus certain to occur, to the great disadvantage of the troops themselves, who often did not exactly know whom they ought to obey. In most cases, therefore, the Officers commanding the troops gave up the "technical troops" to the command of their "technical Officers." The former often preferred not to trouble themselves about this arm, which was only temporarily and indeed only half under their command. The troops themselves were obliged to be guided principally by the opinion of the "technical Officers," since in their hands lay their weal and woe and their future career. But this half-and-half arrangement, as I have already stated in another place ("Letters on Field Artillery"), had a bad effect upon everyone, especially as regarded the discipline of the troops.

But this half-and-half arrangement is now at an end, since the field artillery is now altogether placed under the Generals commanding Districts. Henceforward the qualification returns will pass through the hands of the General in command, and every artillery Officer will say to himself that in applied tactics (for example, at exercises in combination with the other arms) he simply has to work by such principles as shall be recommended to him by these Officers as correct.

The General in command knows already, from the requirements of his other troops, what he must demand from his field artillery, and has further seen, at his inspections of elementary tactics on the drill ground and on the practice ground, what he may expect and require from their assistance.

Thus the first duty of the artillery is to beat down that of the enemy. The power of the gun teaches us that this can be decisively done at a range of 2,000 to 2,500 metres. Nevertheless, the necessity of protecting the advance of the other arms from the fire of the enemy, and of dividing the enemy's attention, will in most cases oblige us, when acting on the offensive, to open fire earlier at yet longer ranges. If this be done we may reckon on being able to come into action, without suffering serious loss, in positions which offer suitable ranges (2,000 to 2,500 metres) for a decisive artillery combat, and even sometimes to surprise the enemy by so doing. If, however, the character of the country is such, that we can march into these positions without being seen by the enemy, it will then be better to advance into

them at once, without delaying in a more distant position. If we succeed in escaping the enemy's observation until we open fire, we have then surprised him, and there is a considerable probability that we shall find our range, and therefore hit, before he can do so, if only we carry out ranging with the greatest possible calm. We shall then be able to change to shrapnel fire, which indeed is decisive in the artillery combat, earlier than the enemy, and shall thus soon obtain the superiority in the artillery duel.

Observation of the effect of the newest description of shrapnel has of late rendered many gunners fearful that we shall not be able to come into action at 2,000 metres from the enemy's artillery. Most ingenious and complicated means have therefore been thought out, by which to diminish the effect of the hostile fire and to find cover for the advancing artillery, both during the advance and also as they come into action. For some time there was a preference for positions which were in rear of heights instead of on them, and from which it was proposed to hit the enemy by firing over the hills in front, using subsidiary aiming points, which sometimes lay in rear of the guns. A General in command, seeing this, once naïvely asked, "Are you shooting through the hill?" I will acknowledge that this complicated plan may be all right in peace; but in the hurly-burly of battle it will come to grief. In order to carry it out observers must be sent out to the front and flank, for the purpose of signalling the results of the first trial shots. Can the artillery commander absolutely depend upon these men? Observation is in truth so difficult, that he will prefer to keep it in his own hands. Will the signals not be misunderstood if other troops march directly across the station of the observers? But the principal objection to such a position is, that we cannot from it fire at the foot of the hills. If the enemy advances to the attack, we cannot from a position of this kind hit the ground at the base of the hills, and cannot therefore assist the other arms of our own army in repulsing the attack. There is even some risk that the enemy's infantry may reach the crest of the heights through this dead angle, and may thus rush in on us from a very short distance without our being able to fire on them. The energetic advocate of the auxiliary aiming point would in such a case move forward to the crest of the heights. But who can assure me that my guns will still be capable of movement? The artillery duel will, in future, cause far larger loss than it formerly did, and it may very well happen that, if many horses are hit, the necessary supply of others may take up so much time, that we shall not be able to make use of the proper moment for taking up a position on the crest of the heights. Practice with auxiliary aiming points is an excellent invention for siege and fortress work, and has been rendered systematic by the use of the new elevating arcs; in these cases it also very much assists the correct service of the guns. But field artillery will be able to employ it with advantage only under very rare and exceptional circumstances. The normal, and in most cases the best, position for field artillery is, and will continue to be, that which affords the best view, that is to say on the crest of the heights. There is, of course, no reason why this crest should not be used to give cover, provided that the guns can look directly over the hill. But they must, especially when on the defensive, be able to hit the foot of the height.

Another scheme for diminishing the effect of the enemy's fire, and one which even gunners with much experience believed in after a time, was to advance the position to the front slope of the hill; the idea being that artillery which stands in front of a background higher than itself is more difficult to see and to hit than if it showed clearly against the horizon. This plan may now and then be correct, when such artillery has some quite special task to carry out. But as a rule a position on the slope which lies towards

the enemy will, when the latter is posted on the hill, be so limited both in the length and the breadth of its field of sight, that it will be distinctly undesirable, and we shall be absolutely obliged to prefer the position on the height in rear, as offering a better view.

Other ingenious people have made their hobby of an unseen creeping-up into position, and have thus thrown away an enormous amount of time before they got to work.

I need hardly say that every intelligent gunner will make use of all such natural cover as the character of the ground may afford, just as an infantry soldier, when he is under fire, seeks for shelter behind trees, undulations of the ground, bushes, walls, and hedge. With this object the guns should, as I have already said, be brought only so far up to the crest of the height as will allow the bore to clear it. Use should be made of everything which may render the target difficult for the enemy. For example, a hedge which stands a few hundred paces in front of the line of artillery may easily deceive the foe. He probably thinks that we are standing close up to this hedge, and therefore ranges himself and expends all his ammunition upon it; I once saw this happen to my great delight. A high wood which stands directly in rear of us may render us completely invisible, if the sun is at such an angle that the shadow of the trees falls upon our line of guns; there are also other similar cases. Artificial cover should certainly be thrown up, even during an action, if there is time to do so. We should also select for choice a line of advance which is covered from the view of the enemy by the lie of the ground, rather than one which is easily visible to him. It would lead me too far if I should here speak of all the possibilities which can be appreciated and made use of, when the character of the ground is correctly known. But we must take care not to search too anxiously for cover, since to do so entails the risk of making our own men sensitive about it, while it makes fear a matter of regulation and takes the edge off their dash. There is no protection from fire equal to killing your enemy as quickly as possible.

It is especially important that we should use the shortest road into position and open fire as quickly as possible, when the moment approaches at which the other arms will push on into decisive action. In this case the artillery which is to advance will be greatly assisted in their movement, if another line of artillery continues to fire from a longer range. If this be carried out the combat will rage along the whole line, and there is more likelihood that the enemy will not pay strict attention to the advancing guns, and will not therefore fire at them. At the Battle of St. Privat single batteries pushed forward straight across the open until they were within 300 paces of the enemy's infantry, whom they surprised with their effective fire. Owing to the present power of field-guns such short ranges will in future be necessary only when the artillery would in all other positions be masked by the other troops of their own force. The range of 1,000 metres will be quite near enough, for the effect of field artillery does not materially increase after this.

The action of field artillery in the attack requires as a rule three positions. From the first fire is opened at long ranges. The advance into the second is made in echelons, whenever it may be desired to bring the artillery fight to a final decision. This second position will be found at a range of about 2,000 metres or a little over. When the enemy's artillery has been overcome, the other arms move on to the attack and the artillery advances, again by echelons, to within about 1,000 metres of the object of attack, with the object of making it impossible for the enemy to direct his fire upon the other arms. When our infantry has got in to 500 metres, and has combined their fire with that of the artillery, this fire will continue for a short time only, until the enemy has been so broken by it that the charge can succeed.

The first of these positions should be carefully selected, and the movement into it should be made under cover, in order wherever possible to surprise the enemy by our appearance in it. In taking up the second position, and yet more in taking up the third, considerations regarding a prompt effect of our fire are of more importance than those relating to cover in front of the battery.

It obviously cannot be my intention to lay down here a system which shall be applicable to all cases. A favourable opportunity, or the nature of the ground, may make it unnecessary, or altogether impossible, to take up three different positions. If, for example, the character of the ground is so favourable, that we can surprise the enemy by moving unseen and at once into a position at a range of 2,200 metres, we ought to omit the first position. If, after having taken up a position at a long range, we find that between it and the enemy there is but one other, and that that is at a range of about 1,400 or 1,500 metres, then the second and third positions will be one and the same. In cavalry actions more especially we shall often take up less than three positions, and sometimes shall use only one, that for final and decisive action.

When acting on the defensive the General in command will indicate that artillery position to which he attributes the greatest value. That arm will arrange for a stout resistance at this point, both by increasing their fire-effect by ascertaining the various ranges, and by diminishing the effect of the enemy's fire by means of the construction of artificial cover. If the main position is anything more than a rear-guard position (in which it is proposed to hold the enemy only for a time, and which it is intended to abandon at some definite moment), and is such that the General is determined to fight a decisive action upon it, the artillery will, in order to lessen the loss, send back their teams into places which afford cover, and should perhaps station their ammunition-wagons (the teams being unhooked) in rear of the guns, either in lieu of or in addition to the limbers. If the enemy can possibly manage it, he will not attack the strong front, but rather a wing or a flank. Again a good defence is inconceivable unless it be combined with a counter-attack. In order to oppose the movements which I have first mentioned, and with the object of emphasizing counter-attacks by the use of artillery, a part of the batteries should be kept ready in reserve with their horses hooked in. At the present day, when the artillery forms an integral part of the army corps, and is no longer a more or less independent technical arm, the General in command will not, even in peace manœuvres, permit the batteries to leave their position before they have received an order from the commander of the troops to do so. He well knows that the retirement of artillery may far too easily become the signal for a general retreat, and that the infantry can more readily sustain an attack when it is supported by the fire of artillery up to the shortest ranges. The dread of losing guns is no longer a factor in the question. The loss of guns is of itself no disgrace. Some batteries have lost guns and have thus gained the highest honour; and this, perhaps, entirely because they did lose them.

The offensive and the defensive are not always very sharply divided from each other. The last wars have afforded many examples of accidental encounters, in which both sides proposed to attack. Cases have also occurred where neither side had any definite idea of attacking, but where both of them found themselves on the march and thus accidentally came in contact. In such cases only the Officer commanding the troops can lay down where the artillery is to come into action, since their place is at the point where he intends to deploy, that is, to pass from the order of march to the order of battle. The fact that the artillery now forms an integral part of the army corps will in this case have the most advantageous results, since they will

thus be accustomed to carry out in their entirety the orders of the Officer commanding the troops and to enter into his ideas, instead of, as formerly, desiring to be a detached, isolated, and independent arm. In accidental encounters the artillery must, when they first form line, move with the greatest possible rapidity. The nature of such casual engagements is the origin of the fact that in them neither party takes up the attitude of assailant or defender in such a distinct manner as is the case in pre-arranged and well-planned actions. The fight sways more backwards and forwards, and the *rôles* vary according as the troops which come up into action change the condition of one or the other side. In this case less care need be taken with regard to cover in the artillery positions, and we should strive only to obtain the best possible effect from our fire. Artificial cover should also rarely be thrown up for the guns, but the limbers and teams may be placed behind natural shelter.

III. Personal Matters.

It follows, as a necessary consequence of the organization of the field artillery under the Generals commanding Districts, that all personal matters concerning the Officers will from this time forward pass through their hands into those of the highest authorities, instead of, as formerly, passing for the greater part through the Inspectors and the Inspector-General.

Personal matters which affect the Officers include—

- i. Questions connected with military law.
- ii. Questions regarding the laws of honour.
- iii. The selection of Officers as Instructors and for special appointments.
- iv. All estimates and decisions with regard to the general efficiency of Officers, and to their qualifications for promotion.

i. Questions connected with military law have always been in the hands of Generals of Districts.

ii. I have for this reason never been able to understand why questions regarding the laws of honour have, in the case of Officers of the artillery, followed up to the present another path. It is impossible that questions of honour can be judged differently in the case of one arm and in that of the others, even though the former were really differently situated as regarded technical and scientific matters. The fact that all questions arising on this subject were decided by a second authority was certainly not of advantage to the status of the artillery. Such an arrangement was directly calculated to awaken a suspicion that questions affecting honour were less sharply looked after in the artillery, and that scientific proficiency was perhaps held to be of more importance; such a suspicion must injure the status of the arm with respect to the Army in general. This difficulty was further accentuated by conflicts regarding command between the various authorities. The fact that the Generals of Districts were supreme in matters of military law, while the superintendence of interior economy was the duty of the superior Officers of the arm, was already sufficient to produce conflicts respecting command. While the General of the District had to do with courts-martial, the superior Officers of the arm had the control of the keeping of the books, including the defaulter-books. But if, on the occasion of a court-martial, a sentence is laid before the General of a District with the nature of which he finds fault, while the united opinion of the superior Officers of the arm supports it, there must be a conflict of authority, and the junior Officers cannot sometimes be certain as to whose opinion they ought to follow. And such conflicts are even more likely to occur in the case of questions of honour. For even the very best authorities sometimes differ in

opinion as to whether a certain case calls for the decision of a court-martial or of a court of honour. But it is very desirable, in the interests of the discipline of the troops, that all such matters should be governed by one spirit and one principle. I may be told that the wording of the law affords complete and satisfactory guidance in this matter. But troops cannot be governed by the letter of the law. The letter kills. The letter of the law is only of use for the purpose of expressing its correct spirit. True common-sense, and indeed one single spirit and principle, must direct in all these matters. The preservation of discipline and its superintendence (and thus also the management of the defaulter-books) must be an expression of the spirit in which, following the law, the powers of military justice are administered; and one and the same spirit must govern matters connected with both courts-martial and courts of honour. In this respect the infantry and cavalry were formerly better off than the artillery. In the former, the higher administration of justice, the supervision of discipline (including the inspection of defaulter-books), and the decision as to whether a court of honour should or should not be held, were in one and the same hand, in that of the Officer commanding the Division. Connected with this question is the fact that circumstances which become known owing to a judicial inquiry may really thus grow into matters of importance, owing to the expression of the opinion of so many persons.

But formerly such circumstances did not sometimes come at all officially to the knowledge of the superior Officers of the arm, that is to say, to that of the Inspectors and the Inspector-General. For this reason also it is important, in order to obtain a correct opinion as to the Officers, that the power of higher justice, and all matters connected with questions of honour and the estimate of the efficiency of individuals, should be placed in one and the same hand, exactly as is the case with the infantry and cavalry. In this respect also the artillery is now the equal of the other two arms.

iii. Many a gunner will regard the change of organization of the field artillery with apparently well-founded doubt, so far as regards questions which concern the selection of Officers for Artillery Instructorships and for appointments. These are (in addition to the Instructors in Artillery at the War School and the War Academy) the Instructors at the School for Non-commissioned Officers, at the Artillery and Engineer School, those at the School of Gunnery, and the members of the Proof Committee. But these doubts will diminish, if we do not allow ourselves to be deceived by the unfounded belief that artillery must be a specially scientific arm, and if we do not shirk the certain amount of trouble which is necessary in order to get at the "*raison d'être*" of these institutions.

I must first most decidedly deny that the action of artillery requires more scientific knowledge than does that of the infantry. The laws according to which an infantry bullet flies through the air are exactly the same as those which govern the trajectory of an artillery shell. The only difference is that one is larger than the other. The grooves, the twist of rifling, and the shape of the shot are governed by the same principles in all firearms. The charge has in every case a similar effect. Mathematics, physics, and chemistry play exactly the same part in the infantry as in the artillery. But the infantry has never considered it necessary to pose as a specially scientific and peculiar arm. It has indeed done exactly the reverse. As I have already stated above, it had at one time far surpassed the artillery in progress. It was for nearly twenty years universally provided with rifled firearms, while a part of the artillery considered such weapons as impossible, another part held them to be useless, and a third made vain attempts to invent them. In former days, when the artillery themselves cast their guns, there was more to be said than there is now for the idea that extraordinary

technical knowledge was necessary. But since the firearms of the artillery have been constructed in civil manufactories, just as the infantry arms are, the former, like the latter, have had nothing to do but to prove their weapons and use them in battle.

As soon as the artillery had been armed with rifled guns, they felt the need of a school of instruction after the pattern of that of the infantry. When this institution had been got into working order, it soon came to pass that there was no necessity that a good battery Officer of artillery should stay as long as formerly to study at the Artillery School. The first of the three years of study at this institution had already been dropped, since Ensigns of artillery were permitted to join the War School and to pass through the same elementary training as those of the other arms ; it was next recognized that the last year of study was also unnecessary in order to make a good battery Officer of artillery. Since then the greater proportion of young Officers of artillery remain only a single year (or rather from nine to ten months) at the above institution. What ought they to learn there ? Simply so much as is necessary to enable them to do good work as battery Officers. The best instructors in artillery for them would be Officers selected from the smartest of the senior battery Officers. But these can be perfectly well selected at headquarters, according to the qualification returns of the Generals of Districts, in the same manner as the instructors are selected for the School of Musketry.

My assertion, that a battery Officer of artillery requires no more scientific knowledge than an Officer of infantry, would lead us to the conclusion that a practical Officer of artillery does not in general need to study at any special Artillery School. I do not wish to contradict this conclusion, especially since the School of Gunnery has developed such remarkable efficiency, that an Officer learns there in three or four months more artillery work than he would learn in a year at the Artillery School, and since means are already provided to enable all artillery Officers to visit the School of Gunnery. But I will not enter further into this question, since it is out of place here.

A small number of the students of the Artillery School, particularly such as show special inclination for and interest in science, study at this institution during a second year ; they work at the more advanced subjects connected with artillery, such as physics, chemistry, and higher mathematics. Is a special artillery central authority needed in order to select their instructors ? Certainly not, since these instructors will be chosen from the leading professors of the University of Berlin.

But what shall we say with regard to the Director of the Artillery School ? Every gunner who has in his time visited this institution will agree with me that for this position it is not necessary to have a learned man. The best regimental commander of artillery would certainly be the Director best suited to this institution ; and since I have shown that the General of a District is in a position to judge as to the merits of the artillery Officers who are under his command, it is also unnecessary that a central artillery authority should select the Director of this institution. The selection can be made at headquarters, from the reports received from the Generals of Districts, quite as satisfactorily as is that of the Director of War Schools. The principal characteristic which the Director of the Artillery School must possess is a disposition half soldier and half schoolmaster ; that is to say, he must be a man of authority, and must know how to manage young Officers, of whom so great a number are gathered together at this institution, that their moral and military training is not so easy as is that of a regiment.

Those Officers who have stayed for a second year at the Artillery School will later on, after they have for awhile returned to practical duty, be qualified for appointment to the Proof Committee or to technical institutions,

according as to which form of science they have especially excelled in during their stay at the Artillery School. The reports of the Artillery School will amply suffice to give all information about them, and there is therefore no need for the existence of an artillery authority to make a selection in accordance with these reports.

With respect to the non-commissioned officers' school, the instructors will rarely require to be of exceptional ability, since all that the students at this institution have to learn is limited to such elementary matters that their instruction can be carried on by any moderately educated Officer. Practical laboratory work alone requires special knowledge on the part of the instructor, and this can be taught by the existing Officers of the laboratory in Berlin, who in the practice of their departmental work have developed a system which is rather mechanical than scientific. But for that very reason their instruction will produce better practical results than if it were given in a learned and theoretical form.

iv. The last and the most delicate of these personal questions is the classification of Officers with regard to their efficiency and their suitability for promotion.

I have already stated at sufficient length, that a General in command, who has to lead all arms in war, must be able also to decide as to the standard of their training in peace. He can, moreover, give an exact and satisfactory opinion as to their Officers, owing to the fact that even in peace he has, at the manœuvres, sufficient opportunity of learning their efficiency in leading their arm in battle. This was not formerly the case. The superior Officer of artillery formed his opinion almost altogether on how he found the troops to have been trained. At the manœuvres, when action in combination with the other arms was represented, the field artillery came under the command of the Corps and Division Commanders. The Inspector of Artillery had not always any opportunity of seeing his subordinates at this their principal work. At any rate he could not interfere, either to blame or to improve, unless he was prepared to create friction with the Commander of the troops. Thus frequently nothing was left to him but to depend upon such communications as the Officer commanding the troops might make to him regarding the conduct of the Officers concerned. But these communications were often very scanty. For the Officer commanding the troops had no special reason to interest himself in the individual value of Officers who were only temporarily under his command. Many also were especially averse to find any fault, since they did not know all about the Officers concerned, and did not like to injure their career for reasons founded on merely cursory observation. Thus the opinion given concerning the working of the field artillery was sometimes rather summary, and consisted only of the statement that they had done everything all right. The Inspector of Artillery could not make much out of this, and the consequence was, that the principal quality of an Officer, namely, his efficiency in the conduct of his command when in action in combination with the other arms, had nothing whatever to do with any decision as to his future. This depended principally upon how he trained his men. But is the best armourer, he who makes the sword, always the best fighter? Only, certainly, in very rare cases.

The General in command, under whom the field artillery will from this time forward remain always placed, will henceforth feel as much interest in one of his Officers of artillery as he feels for one of the infantry or cavalry. He will in the course of the year learn to know his Officers throughout the entire circle of their duty. He will thus be in a position to weigh the different duties against each other, and to attribute to each the amount of value which belongs to it. He may perhaps, for example, prefer an Officer who always brings up his guns quickly to the right spot for supporting the

other arms, even if he here and there gives occasion for blame as regards his elementary exercises, to another Officer, whose battery is a pattern for correctness in drill, but who never brings it up ready into position at the right moment; for the former shows a tactical eye and tactical skill, while the latter knows only how to forge the weapon, and not how to use it.

The General in command, who will henceforward take the same interest in all the three arms, will also endeavour to assist all three as regards their promotion. This was not formerly the case, since the recommendations in the artillery did not pass through his office. It mattered nothing to him if the artillery as regarded their career fell behind the infantry and cavalry. The promotion in the whole of the artillery was, by the action of the superior Officers of the arm, kept nearly at a level, and if the artillery of any army corps had at any time a chance of promotion, this was stopped by transferring Officers to it. In this respect also the new organization will be of advantage to the artillery. This will become most distinctly evident in relation to the promotion to the higher ranks. Such promotion will in future depend upon how far Officers are fit to command Divisions. Whether this be the case or not, the arm will nevertheless get a step by such promotion. This was not formerly the case. It used to be said of many a man that, though he was not fit to command a Division, he might still be capable of doing the duty of his rank with the "technical troops." What the other arms formerly thought of the artillery in this respect I once learnt to my horror, when I heard a distinguished old Officer, speaking in praise of a young artillery General, say as follows: "He is not a mere artillery General, he is a real General."

Some apprehension has been expressed on the part of the infantry and cavalry that, owing to the fact that the artillery has been placed under the Generals of Districts, while the Inspectors and the Inspector-General have been abolished, the infantry and cavalry may be prejudiced with regard to their promotion to the command of Divisions, since the artillery will now have their share of it. In my opinion this apprehension is unfounded, since the command of a Division will not be given to every Officer.

The head of the Army will always select such individuals as are competent to employ all three arms, and will not tie himself down to a certain fixed proportion between the different arms. The number of the men who combine sufficient experience with the necessary physical vigour is moreover not too large. It will do no harm to the Army if the selection be made from a larger number of men, since a more exacting standard can then be laid down, and that is to the advantage of all arms.

An opinion has also been expressed, that the artillery will suffer by the abolition of the Inspector-General, since that arm will now have no authority to represent it in influential quarters. This is a loose way of speaking, which has no particular meaning. Will the infantry and cavalry be represented as a whole? And have these two arms any desire to be represented? How is such a representation to be practically expressed?

I am of opinion that the artillery will in future be better represented by the Generals of Districts than it was formerly by the authorities of the arm, whose claims were frequently very troublesome, since they were half considered as being outside the army. For instance, an Instructor in Tactics once spoke against any increase of the artillery, on the ground that the train of the army would be thus very much enlarged. A General who has entire command of the field artillery will no longer regard them as "train," but as an arm. Let us, for example, take the case that the present peace establishment of the field artillery is obviously not sufficient; an Inspector-General of Artillery would have to lay the necessary proposals before the War Ministry. But the latter would undoubtedly be opposed from the first to any scheme of increase, and would say that the artillery are never contented, and are always

asking too much. The Generals of Districts, under the old organization, would have no interest whatever in putting in a word for the improvement of the establishment. But when once the field artillery has been completely put under the command of these Generals, the latter fully sympathize with any possible failing of the peace organization, and the War Ministry cannot altogether avoid supplying a need, which has simultaneously been considered necessary by all the Generals, and which has been so reported by them.

With regard to the position of the artillery in the eyes of the other arms, and of Officers of high rank, it can be improved only by a closer connection with them, and by a more intimate acquaintance. The field artillery were already in war under the command of the Corps and Division Commanders. The longer the war lasted, the higher was the status of the artillery in the eyes of their comrades of the other arms, especially when they had first had an opportunity of fighting shoulder to shoulder with them, and of enduring together to the end. This became more and more evident the longer the war lasted. Everyone who took part in the last war, which continued during nearly eight months, will certify to this fact.

Of what use then was the former representation of the artillery by a central authority of the arm, as far as concerned its status with the other arms? The ruling principle, which had been laid down from long ago for the guidance of the "technical arm," that artillery must not be exposed to infantry fire, had before long struck in such deep roots, that a very esteemed and highly scientific artillery Officer made the assertion that rifled guns could not be served with the necessary care when the gunners were exposed to the risk of losing their lives. It is therefore not astonishing that one of the foremost authorities of the Army (*nomina sunt odiosa*) said once to me, that the chief reason why there was such a rush for the artillery was, that in this arm a man was not exposed to so heavy an infantry fire, and had thus less chance of being shot. However, the artillery has in the last campaigns quite knocked the bottom out of that idea. It has held its ground, and worked very close up to the infantry, under the very heaviest fire of the enemy's infantry. Then after the battle have we not seen Generals embracing their Battery Commanders, while the privates of the infantry patted the guns which had helped them through so many hours of trouble? However, something still remained of the old prejudice, and it is not long since a very influential person, speaking of a corps of Officers which had especially distinguished itself, said that it was really too good for the artillery.

But nothing of this sort will be any longer possible, when the artillery is a part of the army corps, exactly as are the infantry and the cavalry. Then the same sense of belonging to each other, and the same comradeship, will grow up and gather strength in peace, as first arose after hard fighting in war; and no arm will think itself better than another.

The artillery must certainly have a representative in the higher commands of troops to which it is told off, but it does not need to be represented beyond them. This appears a play upon words, but it is not so. It shows the essence of the matter. Namely, that it is decidedly unnecessary that the artillery should have special high authorities to represent its interests, since those authorities which are now permanently, and as a matter of organization, placed over the artillery will naturally take as much care of the interests of the whole of the artillery which belongs to them as they do of their other subordinates. But these authorities will feel the need of a professional gunner on their Staff, either as an Officer of the General Staff, or as an Aide-de-Camp, in order that he may, when necessary, give information regarding such elementary details or matters of regulation as the General in command, considering his multifarious and extensive duties, cannot possibly keep himself up in. This will be found especially necessary at inspections

and manœuvres. All this sort of thing was even formerly so arranged, in the Divisional and Corps commands, that infantry and cavalry Officers were always to be found on the Staff; so that the General when he inspected infantry was accompanied by an infantry Officer, and by a cavalry Officer when he saw the cavalry. Consideration is taken of this fact also in the new organization, since the Staff of each command is to be increased by the addition of an artillery Officer. With regard to further details, we shall hardly expect to find that, in the working of the office, all questions which concern the artillery will be given over to the artillery Officer on the Staff. For example, in the future, as now, personal matters will be left to one Officer and discharges to another, whether they belong to the infantry, cavalry, or artillery. For the Officers can only lay each question before the General for his decision in continuation of what has gone before, and in accordance with the existing laws, rules, and regulations. If it were otherwise, misunderstandings would arise, especially in personal questions, with regard to which the individual opinions and inclinations of the Staff Officer must be altogether set on one side.

Everything which has been discussed in the foregoing paper with regard to the advantages to the artillery and to the Army, which have resulted from placing the field artillery under the Generals of Districts, might lead us to the conclusion, that it would be still better if the field artillery were in peace told off to the Divisions also, exactly as are the infantry and cavalry. But I will not now enter into this question, since I desire to occupy myself with existing facts only, and have no wish to make propositions of organization for the future. Besides, we do not know whether there may not be an intention to make some day or other a change of organization in this direction, while it may perhaps be now merely postponed, in order to avoid making too great an advance all at once.



THE DRILL REGULATIONS OF THE GERMAN FIELD ARTILLERY.

(25th March, 1889.)

By Lieut.-Colonel WALFORD.

THIS little volume is intended to supersede the previous Regulations of the 23rd August, 1877, and the differences, not only in detail but also in principle, between the two show most plainly the direction in which the progress of the German Field Artillery tends to move. In order to appreciate these differences, it may be well to compare the tables of contents.

Each book is divided into five parts, preceded by an introduction, which in the old Regulations was merely formal, but in the new is so valuable that it is proposed to give a summary of it on a later page.

Part I. *The training without guns.*

- i. The training of the individual man. Twelve pages in the old, eight pages in the new book.
- ii. The training in squads. A few paragraphs in each.
- iii. The battery on foot parade. Sixteen pages in the old, eleven pages in the new book.
- iv. The brigade-division on foot parade. Eight pages in the old, a paragraph in the new book.
- v. Mounted drill for horse artillery. Thirty-five pages in the old, five pages in the new.

Part II. *Training with unhorsed guns.*

- i. Standing gun-drill with a single gun. Thirty-five pages in the old, forty pages in the new book.
- ii. Standing gun-drill of a battery. Thirteen pages in the old, nine pages in the new book.
- iii. Standing gun-drill in brigade-division. Not mentioned in the old, a paragraph in the new book.

Part III. *Training with horsed guns.*

- i. General directions. Eight pages in the old, five in the new book.
- ii. Training in driving. Fifty pages in the old, sixteen pages in the new book.
- iii. Drill of the battery. Thirty-five pages in the old, twenty-four pages in the new book.
- iv. Drill of the brigade-division. Twenty-five pages in the old, nine pages in the new book.

N.B. The drill of the regiment (eight pages of the old book) is now omitted altogether.

Part IV. *The fight.* Twenty-six pages in each book, but of these ten in the old and three in the new are devoted to the renewal of ammunition.

Part V. *The inspection parade.* Twenty-two pages in the old, thirteen in the new book.

If we add to the above that there are in the old book seventy-five plans of various movements and formations, while the new Regulations contain only five, we shall realize how greatly the drill has been simplified. It must, however, be noted that the Practice Regulations, which took up six pages of the old book, are now published in a separate pamphlet of nineteen pages.

It is proposed to examine the various changes in detail under the above heads.

Attention must however be first drawn to two points which, though apparently changes in detail, are in reality alterations of principle ; viz. :—

i. There are no longer any differences between field and horse artillery (or, as the Germans call them, the driving and riding batteries), except as regards the very small amount of mounted drill laid down for the latter, including the minimum of sword exercise, and the variation in distance between lines necessitated by the length of the horse.

ii. The whole of the gun detachment (except the gun-leader, who is mounted) is in a field battery carried on the gun, limber, and wagon. "Detachment rear" is used only as an exception, and no other formation is recognized.

The Introduction.

This lays down that all field exercises must be founded upon what is required in war ; they must therefore be simple, but must be fully mastered. All complicated movements are forbidden.

Every Officer, from battery commander upwards, is responsible for the correct instruction of his troops ; his superiors are to interfere if he is careless or unsuccessful, but his method of instruction is to be such as he may think best.

Gun-drill, or drill without guns, is not to be carried on by any unit larger than a battery. The brigade-division is to practise the systematic combination of several batteries with a common tactical object. The larger units of artillery are not to be worked by words of command.

The exercises are to be varied, and to be adapted to the strength of the men and horses ; otherwise weariness will induce slackness.

The training, beginning on easy ground, is to be continued in difficult country ; and is to be carried on at all times of the year.

Junior Officers must be taught how to command a battery ; for they will have to do so in war.

Accurate practice, at the right moment and from the right position, is the main object of the existence of artillery ; to this end they must master their arm, and keep up a high standard of mobility.

Only such words of command as are contained in the Regulations are to be used. If the words of command, trumpet calls, and signals there laid down are not sufficient, a detailed order must be sent.

PART I.—THE TRAINING WITHOUT GUNS.

i. The Training of the Individual Man.

The changes in this section are neither many nor important ; the "closing step" and the "step back" are abolished, and the "sword exercise" is simplified.

Of the latter only three motions remain :

a. Draw swords : in one motion ; the sword brought to the slope. The word of command is now "Das Gewehr-über !" in place of "Gewehr-auf !"

b. The "Present :" word of command "Präsentirt das-Gewehr !" this is now done in one motion, and is our "Carry ;" it was done in two motions, and was our old infantry "Carry."

c. "Return Swords !" in one motion in place of two.

Officers draw their swords on inspection parades only ; Adjutants do not draw their swords, but salute with the hand. The Officer's salute with drawn swords is similar to our own.

ii. *The Training in Squads.*

This has undergone no important change, and requires no further notice.

iii. *The Battery on Foot Parade.*

The battery falls in, as formerly, in two ranks, but is now sized with the tallest men on the flanks, in place of in the front rank. The battery commander is 15 paces (in place of 20) in front of the centre of the battery, and the trumpeters (3) 10 paces instead of 4 from the right of the front rank. A field battery is formed in three sections (Züge) of which the third is composed of drivers; in horse artillery the battery may be formed in two or three sections. The Officers are told off to the sections by the battery commander. Each section is also divided into small sections (Sektionen) of from four to six files.

The formations are: Line, file, column of small sections, and section column; of these the third corresponds to the old "column of fours," while the last is always at close distance, 7 paces. The movements are limited to: the advance in line, and such as are necessary to change from column to line and *vice versa*, together with a few changes of direction.

iv. *The Brigade-Division on Foot Parade.*

Only to be used at inspection parades, and then to be limited to what is strictly needed in order to get the troops into position.

v. *Mounted Drill for Horse Artillery.*

a. *Sword-drill.*—This is now limited to: Draw swords; Return swords; Engage; two cuts and two guards, one on the right and one on the left. It is to be first taught to individual men on foot, and is then to be practised mounted at all paces. Three cuts and all points are abolished, as also fixed rules with regard to the conduct of the practice, which is now left entirely to the battery commander. The result is, that the sword exercise now takes up two pages in place of twenty.

b. *Movements.*—The formations are: Line; column of detachments; file; and the movements are limited to those needed in order to pass from one of those to the other, with in addition the advance in line both direct and diagonal, and the necessary changes of direction. Each movement is to be carried out in one way only, and all wheels in line are abolished.

The charge and all imitation cavalry movements are done away with, riding school details are omitted, and the working of a brigade-division without guns abolished.

PART II.—TRAINING WITH UNHORSED GUNS.

i. *Standing Gun Drill with a Single Gun.*

The gun detachment has been reduced by one number, and now consists of a gun-leader and five numbers. In the horse artillery Nos. 6 and 7 are horse-holders. By the new Regulations the gunners in field batteries are carried, 3, 5, and 4 on the limber, 1 and 2 on the axletree-boxes, but they may mount on either side as may be most convenient; when in "detachment rear" 5, 3, and 4 form the front, and 1 and 2 the rear rank.

"Detachment rear" is to be only exceptionally used, while the "Order of march" is abolished. The posts of the gun numbers when the gun is in action remain the same as in the old Regulations, but the detachment falls in on the gun and not at "detachment rear."

In the horse artillery No. 7 holds the horses of 5, 3, and 4, and stands 4 paces in rear of the limber, 6 holds the horses of 1 and 2, and stands 4 paces in rear of 7; both face the enemy. "Detachment rear" is the only formation for horse artillery detachments.

The gunners with the wagons are carried as with the guns; it is laid down that only three are to come up with each wagon, when the latter moves to the guns in action; in the horse artillery these men are to leave their horses with the 1st Line and come up on the wagon.

A new word "Kanonier" is now used in place of "Artillerist."

At the word "Action" the gun-leader hooks up his sword; the gunners in horse artillery fasten their swords to the saddle; all dismount. There is no change in drill for this, or for "Cease firing!"

"Action front!"—The words "im Vorgehen," are used in place of "im Avanciren." The gun-leader's horse is held by the lead driver instead of by the centre driver, as in the old book; the gun-leader selects a position for his gun and places himself in front of it. The other details are as before. For horse artillery directions are given as to how to dismount in such a manner as may facilitate the taking of the horses by the horse-holders.

"Action rear!"—If no further word be given the limbers drive on 8 paces, if the word "Action rear!" be followed by "Limbers halt!" the gun is run up the 8 paces into position by hand; if the limbers are to go under cover (which is to be the rule), the guns are run by hand into the position chosen by the gun-leader.

The new Regulations give directions for coming into action to a flank, which were absent from the old book.

"Front limber up!"—The only change is the following:—After the gun has been swung round, 4 and 5 are to man the limber-wheels, in order to assist in limbering up. The gun-leader mounts, without waiting for the limbering up to be completed.

"Rear limber up!"—The gun is run back to the limber; after which 4 and 5 man the limber wheels as above. Limbering up to a flank calls for no remark. If the limbers, when the battery comes into action, go under cover, they are there formed facing the guns; if they remain in rear of the guns the horses' heads are turned to the rear.

Gun-drill by Word of Command.—The words of command are slightly simplified; they now stand: "Common shell—Right (Left or In front)—target (named) range—load—lay—nth gun fire!" For example: Common shell—Right—skirmishers—1,600—load—lay—nth gun fire!"

The gun is not sponged out except when firing blank cartridge, and the shell is not at drill entered into the bore, only the motion of loading being made.

If more or less deflection is needed than that constant for the range (for the tangent-scale is vertical) the word of command is "4 more" or "6 less." The deflection leaf is graduated from a zero on the right; thus "less" means right deflection, and "more" left. When once the range, target, and deflection have been given, they are not again mentioned unless it be desired to change one or other of them.

There is hardly any change in the actual drill; but No. 4 now brings up percussion shell unfuzed to the gun-leader, who screws in the percussion-fuze after testing it by shaking: if there be any rattle the fuze is condemned.

The number of the gun, given before the word "Fire!" answers to our "Ready!" When the gun has been fired, No. 2, by the old Regulations, opened the breech, after which the word "run up" was given; both of these are now abolished, the gun being run up without word of command; if it is not to be run up the gun-leader so orders.

Gun-drill without Word of Command.—In this case after the gun has been

fired it is loaded again without any further word of command. Attention is drawn to the necessity of watching that the tangent-scale does not slip down when the gun is fired. A caution is given to No. 2 to take care that, when loading a gun which is limbered up, the steel leaf does not fall out when the breech is opened.

The next paragraph compels us to notice the "Aufsatzplatten;" not that they are new, but because, since we have no equivalent for them, it may be well to describe them. They are small plates of steel, of a peculiar shape, which are placed on the socket of the tangent-scale, fitting round the latter, and which thus diminish the reading on the scale; for example, if the scale be set at 2,100 metres, and an "aufsatzplatte" be placed in position, it will then, read from the upper surface of the "platte," mark about 2,050 metres; if then the scale be run up until it again reads 2,100, it is evident that the individual gun, though nominally laid at 2,100 metres, is really laid at 2,150. Similarly by taking away an "aufsatzplatte" a gun may be made to fire with an elevation less than that used by another, though setting its tangent-scale to the same range. This expedient is intended to make it possible to work guns, which differ in their shooting, by one word of command, and it is customary to use, with common shell, one "aufsatzplatte" at the commencement of the ranging, in order to have a margin in both directions to come and go upon. The "aufsatzplatten" are also used to give a slight increase or decrease of elevation throughout the battery and to make sure that such variation is regular, which would probably not be the case if each No. 2 subdivided the spaces on the tangent-scale by eye. The "aufsatzplatten" are carried by the gun-leader in his fuze-pocket, but are used only when ordered by an Officer.

When firing at a moving target, No. 2, after having laid, calls out "Ready;" but he and No. 3 (who traverses) remain at their posts and follow the movement of the target until it is the turn of the gun to fire; at the word "nth gun" they take post. If the target stops, moves on after stopping, or disappears, No. 2 reports the fact. In the case of a missfire No. 1 (the firing number), if no flame is seen, takes the tube out of the vent; if flame is seen nothing is done until the gun-leader orders.

No. 4 supplies the gun with cartridges (carried in a portable magazine) and shell; No. 5 supplies the gun-leader with fuzes, of which the latter carries generally six.

Fire with Common Shell.—The new word of command is as follows: "Common shell—Right, on the third gun (2 aufsatzplatten) 1,500—4 more." (This last, as before mentioned, means four minutes extra left deflection.)

The use of the quadrant (when the tangent-scale did not give sufficient elevation), of the plumb-line (when the target could not be seen over the sights), and of ranging with the elevating gear alone (when a rapid change was needed), are all given up; their place is in great part taken by the clinometer.

Fire with Shrapnel.—The new word of command is: "Shrapnel—skirmishers in front (1 aufsatzplatte)—1,300."

No. 4 now sets the time-fuze (which is carried fixed); the gun-leader inspects it to see if it is right, corrects it, if necessary, and screws in the detonator. It is necessary to mention that the graduated head of the fuze (which in general pattern resembles our own Time and Percussion fuze) is fixed so tight that it does not move with the rotation of the shell, but is at the same time loose enough to be, with some exertion, turned by hand by No. 4; the gun-leader sets it only when the head, by some accident, is too stiff to be turned without a fuze-key. The time-fuze is carried set to zero, and is at all times set back to this when returned to the limber.

Fire with Case.—The new word of command is as follows: "Case—Right, Cavalry—point blank."

No. 3 alone attends to line ; No. 2 to elevation only ; the latter gives the word "Ready" when firing at a moving target. No. 2 puts in the first case, No. 1 the second, each on his own side. No. 4 remains by the gun-leader until the second case has been loaded—unless he by chance has not a second cartridge in his portable magazine. One round of case was, under the old Regulations, carried on the limber ; both are now in pockets on the trail. At the word "Case !" No. 5 prepares a shrapnel, as, when both the case have been fired, shrapnel with the fuze at zero are to be used ; when these are expended then common shell. No. 4 is responsible that the time-fuze is at zero.

Change of Projectile.—If the shell has not been entered, the fuze (with common shell) is unscrewed by the gun-leader ; a shrapnel fuze is set back to zero, and the shell returned to the limber. If the shell is in the bore the loading is completed.

The words of command are as follows : (i.) "H-a-l-t ! Shrapnel—1,300," or (ii.) "H-a-l-t ! Common shell—right, 4th Battery, 3rd gun—1,600," or (iii.) "H-a-l-t ! Case—left, cavalry—point blank."

Any common shell in the gun is to be fired in the new direction with the correct elevation for that range ; shrapnel are to be fired with special range and in selected direction ; case is to be unloaded.

Change of Target.—The words of command are : "H-a-l-t !—left, battery coming into action—same range," or "H-a-l-t !—right, skirmishers at edge of village—1,400."

Use of the Clinometer.—The clinometer is used—

- (a.) When the tangent-scale is not long enough.
- (b.) When the target cannot be seen over the sights.
- (c.) When the target is hard to see.

It is used as follows :—The gun-leader places the clinometer in its position, allowing for such "aufsatzplatten" as may have been added or taken away. He alone attends to the elevation.

(a.) No. 2 raises the tangent-scale to its extreme height, and gives the necessary deflection ; he then lays for line either over the sights or by an auxiliary point ; the elevation is given by the clinometer.

(b.) No. 2 raises the tangent-scale to the required height, falls back, if necessary as far as the limber, and gets the foresight in line with the target ; he then traverses the backsight into this line ; elevation is again given by the clinometer.

(c.) No. 2 sets the tangent-scale at the required height, and lays for line, either directly or by an auxiliary point ; the gun-leader, as before, gives the elevation by the clinometer.

When No. 2 has laid the gun for line he, in each case, gives the word "Right !" The gun-leader is always to measure with the clinometer the angle between the line of sight and the horizontal ("Geländewinkel"), and is to allow for this when laying with quadrant elevation.

Laying with an Auxiliary Point.—No. 2 is always, when firing at a standing target, to select an auxiliary laying-point, either in front or in rear. The gun-leader and No. 3 are to be informed as to the point chosen. Such a point is used to give line only, elevation being given by the clinometer.

If no suitable point can be found, the laying-pole ("richtlatte") is to be used. This is a pole, about 6 feet in length, painted in alternate feet in black and white ; it is set up either in front or in rear of the gun, and is used as an auxiliary point for laying. The fact that one side of it is planed off to a flat surface, and the manner in which it is painted would lead one to imagine that the horizontal lines so shown might be used for giving elevation, but nothing is said of any such use in the Regulations.

Unloading.—Case only is unloaded ; No. 4 takes the cartridge, No. 2 replaces the case.

Replacing Casualties in Action.—No. 2 becomes gun-leader ; the others are replaced as the gun-leader may please.

Use of the Brakes.—These are put on by order of the gun-leader, by Nos. 1 and 2, who can also work them from the axletree seats when on the move.

Suspension of Fire.—Word of command : “H-a-l-t !—Stand at ease !” All shell are returned and the gun examined. At “Attention !” all take post ; at “Continue the fire” the action is carried on.

Cease Firing.—Word of command : “H-a-l-t !—Battery halt !” All the numbers return stores, and all boxes are locked. Loaded shell are to be dealt with as under “Change of projectile.”

Fire with Blank Cartridge.—No drill shot are to be with the guns ; if there be any, they are to be locked up. No. 5, having no shell to issue, sponges ; care to be taken to keep the sponge clean. There are several minor differences in the drill from that used at practice, but they are unimportant.

Two points remain to be noticed :—

- (i.) Changing round is abolished.
- (ii.) Case is always to be laid point blank, not “over the thumb” as of old.

ii. Standing Gun Drill of a Battery.

This section has been so much improved that much of it is practically new ; it is proposed to examine it by paragraphs.

General Principles.

This drill is to be carried on as with a single gun, with the exceptions named hereafter.

Section Officers are to attend to the service of the guns and to see that the targets are understood ; they must also approve of the selection of auxiliary marks. They repeat the range and the “aufsatzplatten,” beginning from the flank where the battery commander stands ; if he is in the centre, then from the right. When it is difficult to hear (*e.g.*, in a high wind) they are to repeat all words of command.

The planting of laying-poles is ordered by the section commander for a single gun, by the battery commander for the battery. This should be done, if possible, before fire commences ; if it has commenced they will be placed alternately (in rear) for each gun of each section.

Ammunition is, as a rule, to be taken from the wagons. The wagon commander will tell off two men to issue shell, the third attending to the portable magazines and fuzes. No. 5 will receive the last, and issue them. It will often be well to bring up the shell to the guns in their boxes ; this will be done by the No. 5 assisted by the wagon numbers.

Telling of the Battery.—The battery is to be told off in sections of two guns from the right ; the guns are also to be numbered. These numbers are to be preserved under all circumstances. All posts in a battery in action are as at single gun-drill, the guns being at 20 paces interval ; but this space is not to be considered invariable.

The battery commander is to stand where he can best observe the battery and the target ; the section commanders between their guns and 10 paces from the points of the trails ; but they are not bound to these spots.

The wagons are to be constantly used at drill in place of the limbers ; they are to stand reversed 30 paces in rear of the right gun of each section.

The Order of Fire.—The fire of common shell and shrapnel is to begin from one flank of the battery, the guns being fired by order of the section commanders in turn from the named flank.

The rate of *ordinary fire* is governed by the necessity for the careful observation of each shell.

If the battery commander wishes himself to note the effect of each individual shell, he gives the command "*Slow fire!*" Each gun will then be fired by command of the section commander when the battery commander gives the word "*Shot!*"

Sectional fire is used only when firing case; each section commander fires his guns without reference to the other sections. The independent fire of individual guns has been abolished.

At the word of command "*Rapid fire!*" all guns which are loaded will be fired as quickly as possible in their turn. If firing common shell they will be reloaded at once; if shrapnel is being used they will wait until the range has been given. After the one round the previous rate of fire will be adhered to.

If the gun whose turn it is to fire is not ready, the section commander calls out "*nth gun falls out!*" The next gun is fired, and the gun which was not ready waits until its turn comes round again.

When the whole battery has fired, the section commander reports "*Fire through!*" this is repeated by the other section commanders in turn.

When firing at a moving target, No. 2 of that gun only whose turn it is to fire gives the word "*Ready!*"

The word of command for a salvo is: "*Salvo!*" or "*2nd and 3rd Sections, Salvo!*" Each section commander, when the guns of his section are ready, reports "*nth Section, ready!*" The word of command of the battery commander is "*Battery, fire!*"

When a salvo has been fired by the whole battery, and it is desired to continue ordinary fire, the battery commander orders "*From right (or left) flank, fire!*" When a salvo of shrapnel has been fired, a fresh shell must not be placed in the gun until the range has been ordered.

Three systems of loading are laid down:—

(i.) Loading through the battery ("*durchgehendes laden*"). Each gun is run up and loaded immediately after firing.

(ii.) Sectional loading ("*zugweisen laden*"). At the word of command "*By sections, nth Section, 1,800,*" only the guns of the named section will be made ready and fired. The others will be laid and their breeches opened, No. 4 being ready to set the fuze, and the gun-leader to put in the detonator. This plan will be used with shrapnel.

(iii.) Loading by rounds ("*Lagenweisen laden*").

N.B. "*Lage*" means one round through the battery.

One round per gun will be loaded and made ready at the word of command "*By rounds—1,800,*" The next round will be governed by the word "*Next round—1,900.*" The latter word of command may be given before the first round is finished, in which case the guns which have not fired keep to the range first given. After firing, the guns will be worked as in the case of sectional loading. All loaded guns must be fired before commencing "*loading by rounds.*"

In order to change from (ii) or (iii) to (i) the word of command is "*Load through!*"

If, when using "*ordinary fire*" it is desired to increase or diminish the rate, the battery commander orders "*Shorter (or longer) fire intervals.*"

Section commanders observe the fall, right or left, of every shot of their guns, except in "*rapid firing*," "*sectional firing*," or a salvo. If the battery commander wishes for information on this point, he asks "*Line?*" the section commander concerned answers "*Right!*" "*4 left*" or "*Doubtful!*"

The Distribution of Fire.—If the whole width of the target is to be brought under fire, the order is given "*Distribute the fire!*" The section commanders then tell off each gun to a part of the target.

When firing case, the laying numbers choose their own part of the target. Each gun, as a rule, is to fire at that portion which is opposite to it, but when firing shrapnel or case, no gun must be laid too near the flanks.

If the battery commander wishes to give any special direction to the fire, he orders "Lay on the three guns on the right!"

Opening Fire.—The words of command are as at standing gun-drill of a single gun.

If the clinometer be needed by the whole battery, the battery commander orders its use. When the range is greater than that marked on the tangent-scale, the section commander takes the deflection from the range table. He also corrects, if necessary, the deflection laid down for any particular range.

When the target is stationary, the angle between the line of sight and the horizontal is to be measured by all the guns; this is to be done at the first round, if possible, and at the latest when the battery is ranged; but this operation is not to interfere with the fire. If the target is at very varying heights it may be necessary to repeatedly measure this angle after the fire has been distributed.

Change of Projectile.—The words of command are as before.

When the projectile has been changed, or the length of the fuze altered, the section commander of the gun which first takes up the change must, before firing, report "Common shell," "Shrapnel," or "New fuze."

If a gun has lost its turn before or after a change of projectile, the section commander reports "Shrapnel," "Common shell," or "Old fuze!" This order is provided to prevent mistakes in observation.

Change of Target.—(i.) When the same projectile is retained. The words of command will be as follows: "H-a-l-t!—Right, on the battery unlimbering—same range;" or, if the range be changed, "H-a-l-t!—Left, Cavalry—1,600." If the guns be loaded with shrapnel, then: "Rapid fire!" after which "Right, the Battery—1,800."

(ii.) When the projectile is changed. The words of command are as follows: "H-a-l-t!—Case—Right, skirmishers—point blank." Or when changing from shrapnel to common, "H-a-l-t—Common shell—Rapid fire!" When this is finished, then "Right, skirmishers in shelter-trenches—1,400." The guns which were loaded with shrapnel are fired at the old target, the common shell at the new. This plan is also to be followed when a change is made to a considerably longer range.

If the word be "H-a-l-t!—Common shell—directly against the infantry advancing from the village—1,100," the battery will turn immediately on to the new target.

Movements with Unlimbered Guns.—Changes of front.

(a.) Word of command: "Change front on the *n*th gun!" The gun named is thrown round to the new front, the others are run up or back by hand, the gun-leaders placing themselves in the new position, and serving as points. The limbers and wagons are, when possible, to conform.

(b.) Word of command: "*n*th Section, right (or left) wheel—march!" The flank gun is thrown round to the new flank and loaded; the next moves up by the shortest way with 5 paces interval.

(c.) Word of command: "Battery in action, about—march!" The guns reverse; the led horses and carriages clear the front.

iii. Standing Gun Drill in Brigade-Division.

This is rather, to speak correctly, training in the conduct of fire of the brigade-division, for it is to be carried out on tactical lines with some distinct problem for its central idea, and it is specially ordered that it is to be worked on the system laid down in Part IV, The Fight. Every drill is to be followed by a lecture

PART III.—TRAINING WITH HORSED GUNS.

i. *The Course of Training.*

It is laid down that the course of training is to begin with instruction in driving ; this is to be followed by the practice of all the regulation movements and formations on level ground, after which the battery is to be worked in difficult ground and on some tactical plan.

The order of the guns may be inverted ; the main point is that the battery shall form line rapidly to either flank.

Especial importance is to be attributed to—

- (a.) A long quiet trot in battery column over all kinds of ground.
- (b.) Rapid forming line.
- (c.) A quick appreciation of the different points of direction for the march in open battery.
- (d.) Skilful limbering up and unlimbering.

Passing over the definitions of various expressions and also the list of intervals and distances, which will be referred to on a later page, it is however worth while to notice the following signals, which may be made with either the sword or the arm :—

“Follow me !”—Arm high, pointing out the direction to be taken.

“Halt !”—Let the arm fall.

“Increase to next pace !”—Swing the arm over the head.

“Diminish the pace !”—Arm held out horizontally.

The details of the various paces remain as in the old Regulations, but the limitations therein contained as to the use of the gallop by field batteries are struck out.

Another change which has been made is with regard to the “dressing ;” by the old Regulations the battery always dressed by the right ; by the new it, when in line, dresses by the commander of the second section from the right, unless a special order be given to dress by a flank.

By the new Regulations the system of wheeling has been somewhat changed ; the outer flank is no longer to increase its pace, but is to move at that previously ordered, while the inner flank is to lessen its pace ; again, when forming line, the outer gun is to move at the former pace, provided that it be not less than a trot.

ii. *Instruction in Driving.*

This, which formerly filled an Appendix of fifty pages, is now placed in its proper position, and is at the same time considerably shortened by the omission of the whole of what may be called the “riding school” part of the training. A mass of details of no practical use, but requiring an enormous amount of time for their acquirement, and including thirty-seven out of fifty-nine paragraphs, have been abolished, while the others have been at once improved and cut down.

The course as now arranged is very practical, and includes driving over all descriptions of ground—soft, hilly, and wooded, and a certain amount of jumping.

No system of equitation is laid down in either book, but instruction in this is probably (as formerly) carried on in accordance with the Cavalry Drill-book.

iii. *Drill of the Battery.*

A battery at war strength consists, as before, of 6 guns, 8 ammunition-wagons, 3 store wagons, a field-forge, and the Officers’ and spare horses.

It is divided into—

FIG. 1. OPEN BATTERY.
FIELD ARTILLERY.

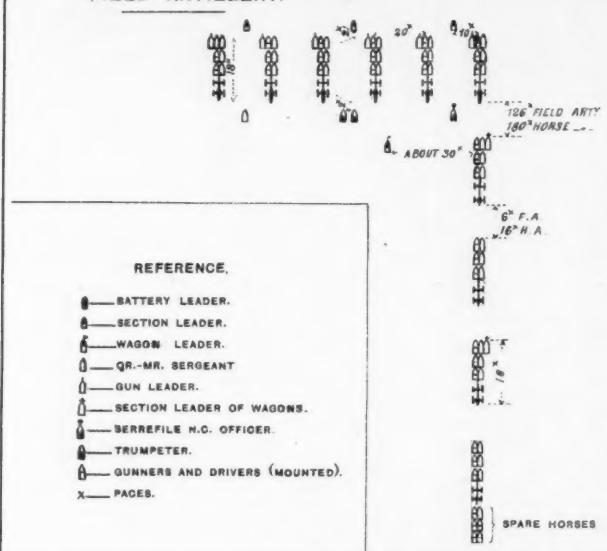


FIG. 2. CLOSE BATT.
HORSE ARTILLERY.

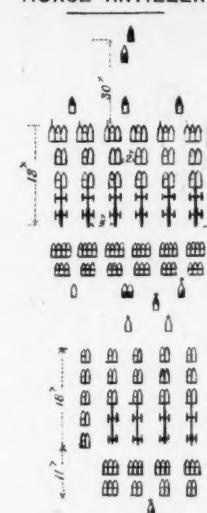


FIG. 7. BROAD COLUMN.

HORSE ARTILLERY.

FIELD ARTILLERY

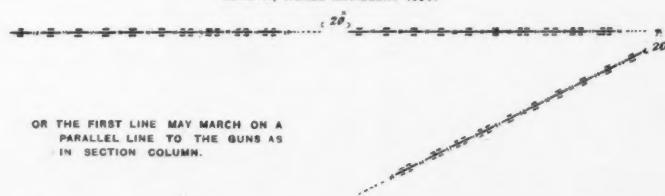


FIG. 8. BRIGADE DIVISION COLUMN.

LENGTH, FIELD ARTILLERY 81^g



LENGTH, HORSE ARTILLERY 100^g



CLOSE BATTERY.
ARTILLERY.

FIG. 3. BATTERY COLUMN.
FIELD ARTILLERY.

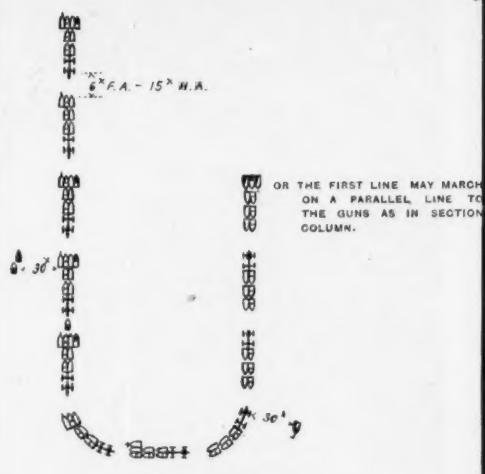
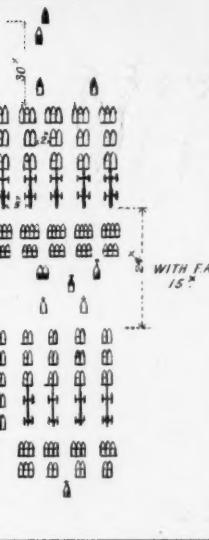


FIG. 9. BRIGADE DIVISION

MOVEMENT TO A FLANK

HORSE ARTILLERY.

FIELD ARTILLERY.



G. 3. BATTERY COLUMN.
FIELD ARTILLERY.



FIG. 4 SECTION COLUMN.
FIELD ARTILLERY.

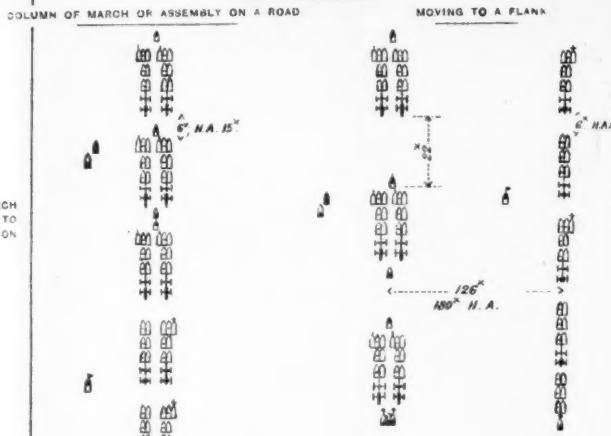


FIG. 9. BRIGADE DIVISION IN SECTION COLUMN.

TO A FLANK

FIELD ARTILLERY,

ON THE MARCH

HORSE ARTILLERY 56^x



10 PACES DISTANCE.

FIG. 10. BRIGADE DIVISION IN BATTERY COLUMNS.

HORSE ARTILLERY, FULL INTERVAL

FIELD ARTILLERY, REDUCED INTERVAL

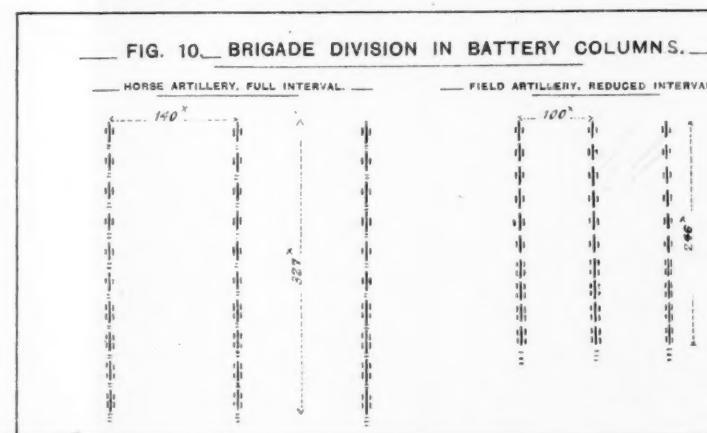


FIG. 5.—BRIGADE DIVISION IN LINE.

C.—COMMANDER.
A.—ADJUTANT.
T.—TRUMPETER.

TT. A.

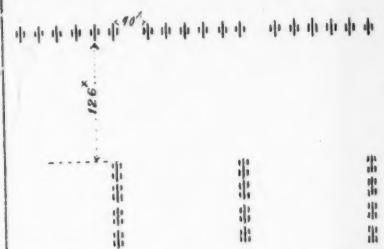
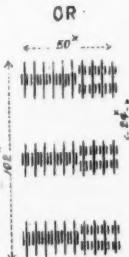
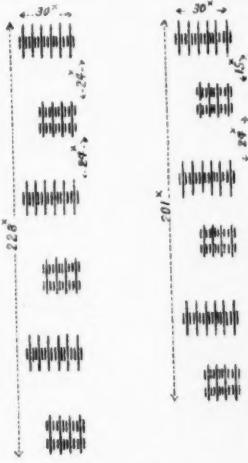


FIG. 6.—DEEP COLUMN.

HORSE ARTILLERY.

FIELD ARTILLERY.



COLUMNS.—

REDUCED INTERVAL





(a.) The "fighting battery," which consists of the six guns and the 1st Line, including three ammunition-wagons, one store-wagon, and the Officers' horses.

(b.) The 2nd Line, including the remaining wagons and the spare horses.

The new Regulations are drawn up for a battery at war strength, whereas the old book was arranged for a peace battery of four guns and no wagons.

The Formations.—Of the former six formations four are retained, with such changes as the addition of the 1st Line necessitates; but the names of those four are altered.

Taking them in order—

(a.) The "battery in line at full interval" has become the "open battery."

This (Fig. 1) is intended to be used for advancing and retiring within the zone of the enemy's fire. It is formed as shown in the accompanying diagram; the column of wagons may cover either flank. It will be observed that the gun-leaders, who used to march on the off-side of the off-leader, have now * changed sides, and that the positions in column of the section leaders, both of guns and wagons, have also been altered.

(b.) The "battery in line at close interval" is now the "close battery."

This formation (Fig. 2) is to be used for assembly, for parking, and for parade work. In the two first cases the 1st Line may also be in line on either flank of the guns.

(c.) The "column on one" (field column of route) is now the "battery column." It (Fig. 3) is employed for the advance or retirement or for flank movements within the zone of the fire of the enemy, as a column of march, and as an assembly formation when the troops fall in on a road.

(d.) The "open column of sections" has been abolished.

(e.) The "close column of sections" is now called the "section column."

The section column (Fig. 4) serves for flank movements (as a rule outside of the range of the enemy's fire) as a column of march, and as an assembly formation on broad roads. In the two last cases the 1st Line will follow the guns in column of sections, all distances being closed to 6 paces with field and 15 with horse artillery.

We thus find that the open battery and the battery column are alone to be used on the field of battle, while there are two orders of march available, according to the width of the road.

Passing over the succeeding paragraphs, which deal with the posts of the Officers, &c. (which are shown in the diagrams), dressing, mounting and dismounting, and honours, we come to—

The Movements of the Battery.—These have been reduced from forty-nine to twenty-four, and include the following:—

(a.) Advance of the open or close battery.

(b.) Retirement of the open battery.

(c.) Diagonal march of the open or close battery.

(d.) To diminish the intervals.

(e.) To increase the intervals.

(f.) The wheel of a close battery (to the right, left, or about).

(g.) Change of direction in open or close battery.

(h.) Open battery to battery column—

(i.) To a flank. By taking ground.

(ii.) To the front. By advance of flank gun.

(i.) Close battery to battery column (by advance of flank gun).

(j.) Open battery to section column (by the wheel of sections to a flank).

(k.) Close battery to section column (by the advance of a flank section).

(l.) From section column to battery column (by the advance of flank gun).

(m.) From battery column to section column (rear guns of sections form on leading guns).

- (a.) Increasing or diminishing intervals in section column.
- (b.) Advance of the battery or section column.
- (c.) Retirement of ditto, ditto.
- (d.) Diagonal march of ditto, ditto.
- (e.) March of ditto, ditto to a flank (by taking ground). This is only to be used for a short distance.
- (f.) Changes of direction of ditto, ditto.
- (g.) Battery column to open battery—
 - (i.) To a flank. By taking ground.
 - (ii.) To the front. By forming line.
- (h.) Section column to open or closed battery—
 - (i.) To a flank. By the wheel of sections.
 - (ii.) To the front. By forming line.

A. Action front and rear.

B. Cease firing and limber up.

Of the above it will be necessary only to notice the two last.

A. The battery commander is to precede the battery, which the next senior brings up. The former places himself where he pleases, and may either dismount or remain mounted. The section commanders pass between their limbers, dismount, and give their horses to the nearest wheel-driver. If a section commander cannot see the target when he is on foot he mounts again. If the limbers stay by the guns the battery commander, as a rule, allows the drivers and horse-holders to dismount. If the order "Limbers under cover" is given, the quartermaster-sergeant takes the limbers under cover at a walk, the led horses leading.

At the word "Action!" the three wagons of the 1st Line advance to the battery and, unless otherwise ordered, reverse one in rear of the right gun of each section. (In peace manoeuvres, when no wagons are present, they are to be represented by shell-boxes.) A wagon leader takes command of these wagons. If there are less than three wagons available the battery commander decides as to their position.

At the word "Limbers under cover" the wagon leader gives the order to unhook, and the teams follow the limbers at a walk.

The senior present takes command of the 1st Line and of the limbers; the renewal of ammunition is the duty of the commander of the 1st Line. He, or the commander of the limbers, places the limbers, teams, and the remainder of the 1st Line under cover as the battery commander shall direct. Their front will be towards the battery, and the mounted men will dismount, except the commander of the 1st Line and the quartermaster-sergeant.

When coming into action to a flank the guns will first open or close to an interval given by the battery commander; if this interval is less than the length of the team, the leading and centre drivers incline to the side away from the enemy; in the horse artillery the detachments form up on that flank also, in line with the wheel-drivers. The 1st Line moves by the shortest road.

B. If the limbers are under cover the battery commander brings them out before ceasing fire, and sends them word at the same time whether he proposes to advance, retire, or move to a flank. The wagon teams, unless otherwise ordered, come up with the limbers and hook in. If the limbers are in rear of the guns the drivers and horse-holders mount at the word "Battery, halt!"

iv. Drill of the Brigade-Division.

The Formations.—Of these there is now the same number as in the old Regulations (6), but they are so changed, both in name and character, that any comparison is impossible. The new formations are—

- (a.) *Line* (Fig. 5).—This is a line of open batteries at 40 paces interval

(the old interval was 20 paces), which space may, however, be diminished or increased.

(b.) *Deep Column* (Fig. 6).—Is a column of close batteries at 15 paces distance in field and 25 in horse artillery; these batteries may have their 1st Line either in rear of, or in line with, the guns. It is to be used only for assembly when space is limited, and for inspection parade purposes.

(c.) *Broad Column* (Fig. 7).—Is a line of close batteries with 15 paces interval. It is employed for assembly, for parking, and for inspection parade purposes.

(d.) *Brigade-Division Column* (Fig. 8).—Is a column of batteries in battery column, with 20 paces distance. It is to be used in the same manner and for the same purposes as the battery column.

(e.) *Brigade-Division in Section Column* (Fig. 9).—Consists of a column of batteries in section column, with 42 paces distance; but this distance will vary with the interval taken between the batteries in line. When at close distance the batteries close to 20 paces. It is to be used for the same purpose and in the same manner as the section column of a single battery.

(f.) *Brigade-Division in Battery Columns* (Fig. 10).—Is a line of battery columns with from 100 to 140 paces interval. The intervals may be varied, except when about to form line, and they need not be equal to each other. This formation is that ordinarily used on the field of battle for movements to the front or rear.

It is hardly necessary to enter into the details as to the position of Officers, but it must be mentioned that the brigade-division commander, with his staff, may place himself at any point where his presence appears desirable, while the battery commanders are at liberty to quit their posts temporarily, if necessary.

The Movements of the Brigade-Division.—Under the old Regulations these were fifty-five in number; they are now twenty-one, as follows:—

(a.) Advance in line.

(b.) Retire in line.

(c.) Diagonal march in line.

(d.) Change of direction in line. (The Commander points out the new direction to the battery of direction; the others conform.)

(e.) From line to brigade-division column (by taking ground).

(f.) From line to brigade-division in section column (by the wheel of sections).

(g.) From line to brigade-division in battery columns (by advance of flank guns).

(h.) From brigade-division in battery columns to brigade-division column (by the wheel of the heads of batteries, or by the advance of a flank battery and two wheels of the others).

The 1st Lines, unless otherwise ordered, directly follow their guns.

(i.) From brigade-division column to brigade-division in battery columns.

(i.) To the front. The leading battery advances at a walk; the others come into line with it at a named pace. If, while the movement is going on, the leading battery changes direction, the others conform.

(ii.) To a flank. By a wheel of the heads of batteries, taking up the interval on the move.

(k.) From brigade-division column to brigade-division in section column. (As in the battery, the rear batteries closing up.)

(l.) Increasing or diminishing intervals in brigade-division in section column.

(m.) From brigade-division in section column to brigade-division column. (Advance of flank guns.)

(n.) From brigade-division column and from brigade-division in section column to deep or broad column.

These movements are carried out by the batteries independently.

(o.) Changes of direction when in brigade-division column or in brigade-division in section column. (By taking ground or wheeling.)

(p.) Change of direction by the brigade-division in battery columns. (Battery of direction changes direction, the others conform.)

(q.) From brigade-division in battery columns to line. (By the wheel of the heads of batteries.)

(r.) From brigade-division column to line—

(i.) To the front. By forming line; each battery moves independently.

(ii.) To a flank. By the wheel of the heads of batteries, followed by forming line. The intervals to be gained during the further advance.

(s.) From brigade-division in section column to line—

(i.) To a flank. By the wheel of the heads of batteries, followed by forming line.

(ii.) To the front. By forming line to the front, carried out by the batteries independently.

Action.—Carried out by batteries, the battery commander deciding as to how he shall come into action.

Cease Firing and Limber up.—The brigade-division commander orders whether his force is to advance, retire, or move to a flank. He then sounds the call "Cease firing." The batteries limber up independently, and the manner of limbering up is left to the battery commanders.

PART IV.—THE FIGHT.

This chapter is so important that none of it can well be omitted, while it is also so concise that it cannot be condensed; since, owing to want of space, it cannot now be given in its entirety, it has been thought better to postpone all mention of it.¹

PART V.—THE INSPECTION PARADE.

Of this it will be sufficient to notice two parts: the parade without guns and the parade with guns.

i. *The Parade without Guns.*

A battery parades in line, a brigade-division or larger body in broad column, of which the batteries are formed in section column with 3 paces interval.

A battery marches past in line or in section column; a larger force in column of batteries or in section column.

ii. *The Parade with Guns.*

A battery parades in close battery; a brigade-division in broad column, if the available space will permit; if it will not, then in deep column.

All units march past on the front of a battery, or in section column.

The march past may be at a walk, a trot, or a gallop.

Detailed comment on the new Regulations would be superfluous, even if space would permit of it; the simplicity and conciseness of the whole book

¹ A translation of the whole part will appear in the next number of the R.U.S.I. Journal.

are marvellous, while at the same time it is impossible to point to the omission of any single point which would or could be of importance in war. It is desirable, however, to draw attention to the following :—

(i.) The only portion of the book which has been increased in length is the "Standing gun-drill with a single gun." In this section alone is the freedom which is given to the battery commander in all other matters confined by rigid rules and orders.

(ii.) There is no provision for any change of front by a battery or brigade-division in line, save such as may be carried out when the guns are in action by running the several guns up or back by hand.

(iii.) All movements of the brigade-division which necessitate anything beyond a simple wheel are carried out independently by batteries.

(iv.) There is a marked tendency, almost amounting to the expression of a principle, to work both batteries and brigade-divisions "on the move," in place of "at the halt."



NOTICES OF BOOKS.

The Queen of Naples and Lord Nelson. By J. JEAFFRESON. Two vols. London: Hurst and Blackett, 1889. Pp. 734. Size 7 $\frac{1}{4}$ " x 5 $\frac{1}{2}$ " x 2 $\frac{3}{4}$ ". Weight under 2 lbs. 12 ozs. Price 21s.

The author has set himself to clear the character of Maria Caroline, Queen of Naples, and has devoted great labour and research to this purpose. We give Mr. Jeaffreson the fullest credit for the best intentions in the line of literature he is following, but we must honestly express our belief that the educated Englishman of the present day no longer judges the morality of the past by the standard of the present, and the detailed examination of the relations between public personages long since passed away is a matter not only of little interest, but one in which he may fairly be excused taking part. We own we are very tired of Emma Hamilton, who reappears in all her notoriety in these pages.

Life of Frederick Marryat. By DAVID HANNAY. London: Walter Scott, 1889. Pp. 159. Size 7" x 5" x $\frac{3}{4}$ ". Weight under 10 ozs. Price 2s. 6d.

Oh! Professor Robertson, who edits this series of *Great Writers*, why Life of *Frederick Marryat*? Why not call him by the name we all know him by, "Captain Marryat," in the days of our boyhood? Why not let us in our maturer years know you are telling us about our old friend? We should at once write to your publisher to learn all about one who gave us as much, if not more enjoyment, than did even the publisher's great namesake. However, we will make good so far as we can your little mistake, by telling old sailors and old soldiers that here is the story of the life of one who charmed us with *Peter Simple*, *Poor Jack*, and above all dear old brave *Masterman Ready*.

A Dictionary of Explosives. By Major J. P. CUNDILL, R.A. Chatham: Mackay and Co., 1889. Pp. 109. Size 8 $\frac{1}{4}$ " x 5 $\frac{1}{4}$ " x $\frac{3}{4}$ ". Weight under 1 lb. 2 ozs. Price 4s. 2s. at R.E. Institute to Officers and non-commissioned officers R.A.

This very useful book comes from the S.M.E., Chatham, and is based on a course of lectures delivered at the School by Major Cundill.

Henry the Fifth. By the Rev. A. J. CHURCH. London: Macmillan, 1889. Pp. 155. Size 7 $\frac{1}{4}$ " x 5 $\frac{1}{4}$ " x $\frac{3}{4}$ ". Weight under 12 ozs. Price 2s. 6d.

David Livingstone. By THOMAS HUGHES. London: Macmillan, 1889. Pp. 208. Size 7 $\frac{1}{4}$ " x 5 $\frac{1}{4}$ " x $\frac{3}{4}$ ". Weight under 1 lb. Price 2s. 6d.

Lord Lawrence. By Sir RICHARD TEMPLE. London: Macmillan, 1889. Pp. 203. Size 7 $\frac{1}{4}$ " x 5 $\frac{1}{4}$ " x $\frac{3}{4}$ ". Weight under 12 ozs. Price 2s. 6d.

Men of Action Series.

We have not the slightest wish to chant the praises of "our noble selves," for we have a firm belief that Englishmen are what they are because Nature made them so. But the appearance of these three biographies almost simultaneously does bring home to one the fact that of all Europeans it is the Englishman who shows his superiority over others as a "man of action," regardless of time or place. This is the sort of literature which should form a part of the mental pabulum of the rising generation in our schools in its efforts to master English history, for it is men like Henry the Fifth, Livingstone, and Lawrence who made it.

Autobiography of Giuseppe Garibaldi. Authorized translation. By A. WEMER, with Supplement by J. W. MARIO. 3 vols. London: Walter Smith and Innes. Pp. 1080. Size 8 $\frac{1}{2}$ " x 5 $\frac{1}{4}$ " x 4 $\frac{1}{2}$ ". Weight under 5 $\frac{1}{2}$ lbs. Price 31s. 6d.

This is a very valuable work, throwing light on modern European history.

Four Famous Soldiers. By T. R. E. HOLMES. London: Allen, 1889. Pp. 344. Size 7 $\frac{1}{4}$ " x 5 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ ". Weight under 1 $\frac{1}{2}$ lbs. Price 6s.

"It never rains but it pours" seems applicable to biographical works to-day. Sir Charles Napier, Sir William Napier, Sir Herbert Edwards, and Hodson of Hodson's Horse are the figures pourtrayed by Mr. Holmes. In future editions the biography of the last-named of the quartette might, with advantage, be omitted. It seems to us little short of cruelty to put side by side with the biographies of three men, each of whom the author seems to regard as a type of excellence in his own way, that of a man of whom he has so low an opinion as he has of Hodson of Hodson's Horse; and which he expresses in such outspoken language. The contrast is almost painful to the readers.

Submarine Mines and Torpedoes as applied to Harbour Defence. By J. T. BUCKNILL, late Major R.E. London: Office of "Engineering," 1889. Pp. 250. Size 10" x 6 $\frac{1}{2}$ " x 1". Weight under 1 lb. 10 ozs. Price 12s. 6d.

The great practical experience of Major Bucknill in Submarine Mines and Torpedoes renders this book of great value.

Les Iles Samoa ou des Navigateurs. Le Conflit entre les États-Unis et l'Allemagne et la Nouvelle Conférence de Berlin. Paris: C. Bayle, 1889. Pamp. Pp. 40. Price 1 fr. 25 c.

Catechism of the Manual of Instruction of Army Signalling. By Major L. EDYE and Captain RHODES, D.S.O. Chatham: Gale and Polden. Pp. 156. Size 7 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ " x $\frac{1}{2}$ ". Weight under 10 ozs. Price 2s. 6d.; post free to any part of the world.

Guides' and Markers' Duties and Company Drill. By WILLIAM GORDON. 5th Edition. Chatham: Gale and Polden. 1s.; in paper covers 9d. each; or 7s. 6d. per dozen, post free.

The undermentioned books have been received and will be noticed in the October number of the Journal:—

Torpedoes and Torpedo Warfare. 2nd Edition. By C. SLEEMAN. Griffin and Co.

Life of C. B. Vignoles, Soldier and Civil Engineer. By O. J. VIGNOLES. Longmans, Green, and Co.

Prospectus and Plan of Elson's Maritime Code of Signals. S. R. Elson, 71, Drummond Harbour, Calcutta.

Embarcation and Disembarkation of Troops. By Colonel FURSE, C.B., A.A.G., Portsmouth.

History of the XXth Regiment, 1688-1888. By Lieutenant B. SMYTH. Simpkin, Marshall, and Co.

Battles and Leaders of the Civil War. 4 vols. 4to. T. Fisher Unwin.

The Army and Navy Calendar, 1889-90. W. H. Allen and Co.

Words on Wellington. By Sir W. FRASER. J. C. Nimmo.

Cold Steel. By Captain A. HUTTON. Clowes and Sons.





EXTRACT FROM THE BY-LAWS.

Section II.—Composition.

1. Princes of the Blood Royal; Lords Lieutenant of Counties; Governors of Colonies and Dependencies; Officers of the Army, Navy, Marines, Her Majesty's East Indian Military and Naval Forces, Militia, Yeomanry, Royal Naval Reserve, and Volunteer Corps shall be entitled to become Members, *without ballot*, on payment of the Entrance Fee and Annual Subscription.

N.B. Any Officer coming within the above definition, who may wish to become a Member of the Institution, can do so by copying one of the subjoined Forms, and inclosing it to the Secretary:—

FORM FOR BECOMING AN ANNUAL SUBSCRIBER.

18

It is my desire to become a Member of the Royal United Service Institution; and I hereby request and authorise my Agents [or Bankers], Messrs. _____, to pay my Entrance Fee (£1) and Annual Subscription (£1) now, and as it becomes due on the 1st of January in each year, to the Secretary of the Institution.

Signature.

Qualification
for Membership.

FORM FOR BECOMING A LIFE SUBSCRIBER.

It is my desire to become a Life Member of the Royal United Service Institution; and I hereby authorise my Agents [or Bankers], Messrs. _____, to pay my Entrance Fee (£1) and Life Subscription (£9) to the Secretary of the Institution.

Signature.

Qualification
for Membership.

2. Ex-Governors of Colonies and Dependencies, Retired Officers, Deputy Lieutenants of Counties, Civil Functionaries who are or have been attached to the Naval and Military Departments, the Master, Deputy Master, and Elder Brethren of the Trinity House, and Army and Navy Agents, shall be *eligible* to become Members by *Ballot*.

3. Gentlemen above the age of *fifteen*, whose names are on the list of the Commander-in-Chief for Commissions in the Army, or who are probationary for offices connected with the Naval and Military Professions, shall be *admissible*, by *Ballot*, to become *PROVISIONAL MEMBERS* from year to year, on payment of the Annual Subscription; and after they obtain their appointments, they may become ordinary Members on payment of the Entrance Fee.

N.B. Members admissible by Ballot must be proposed and seconded by two Members of the Institution, and their names will be submitted to the Council for election. Ballot papers may be obtained at the Institution.

Form of Bequest.

I give and bequeath unto THE ROYAL UNITED SERVICE INSTITUTION, situated in Whitehall Yard, London, the sum of

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Officers who will favour the Institution with a Lecture, or a Course of Lectures, are requested to communicate with the Secretary.

The Lectures, and the Discussions which follow them (or an Abstract of them), and Descriptions of Inventions, are published in the Journal of the Institution, subject to the discretion of the Council, and illustrated, when necessary, by Diagrams.

By order of the Council,

B. BURGESS, Captain,
Secretary.

